

ARI Contractor Report 2002-17

Combat Service Support Training System Development Final Program Development Plan

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FINAL PROGRAM DEVELOPMENT PLAN:

**COMBAT SERVICE SUPPORT
TRAINING SYSTEM DEVELOPMENT**

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U. S. Army Research Institute

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COMBAT SERVICE SUPPORT TRAINING SYSTEM DEVELOPMENT**

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**FINAL PROGRAM DEVELOPMENT PLAN
COMBAT SERVICE SUPPORT TRAINING SYSTEM DEVELOPMENT
FOR U.S. ARMY NATIONAL GUARD UNITS**

I. INTRODUCTION

A. Purpose

This project will result in the development of a prototype training program for U.S. Army National Guard (ARNG) members for use at weekend training assemblies at the armory or at home. Courses will provide training for:

- The Forward Support Battalion (FSB) staff, which is responsible for coordination and synchronization of support to all of the units under the control of the Brigade or operating in the Brigade area.
- Unit level individuals, teams and sections in the medical, maintenance and supply companies of the FSB in the performance of critical collective tasks.

This contract performance plan is submitted in compliance with Contract No. MDA 903-92-D-0075, Delivery Order No. DO 0012-0012AB.

B. Background

In 1989, apparent changes in Soviet policies and corresponding demands to reduce the proportion of the budget devoted to defense led the Army to initiate plans for major force reductions. In 1990, the Army proposed a Base Force plan establishing a mix of 12 active, 6 reserve and 2 cadre reserve divisions. This plan is currently under review to determine if adjustments to the mix of active and reserve forces are needed in order to meet the threats that are presently envisioned while still reducing expenditures.

The active forces are considerably more expensive to maintain than the reserve forces,¹ but the reserve forces cannot be deployed rapidly enough to meet immediate threats. The Gulf War (Operations Desert Shield and Desert Storm) demonstrated that larger (battalion and above) reserve combat units require considerable intensive training to become combat ready.

Recently reported trends from the Combat Training Centers (CTCs)² indicate that casualty evacuation and synchronization of Combat Service Support (CSS) operations are persisting

¹ General Accounting Office, *Army Force Structure: Future Reserve Roles Shaped by New Strategy, Base Force Mandates, and Gulf War*, Dec 1992, page 34.

² Video Teleconference on *Combat Training Center Trends* conducted by the Center for Army Lessons Learned on 21 Oct 1992.

weaknesses. The General Accounting Office (GAO) report indicated that National Guard Units were unable to mobilize sufficient numbers of MOS-qualified soldiers in several specialties critical to FSB operations, most notably mechanics. Reports from the National Training Center also indicated that National Guard units were not adept at the Command and Control of all the battlefield assets available to a brigade.

The fundamental problem in reserve training is that there are only 12 weekends and one 15 - day period of active training each year: a total of 39 training days available. Some of this time must be devoted to administrative activities, recruiting, and special training such as civil disturbance training. Additionally, many unit home stations (armories) are located at an appreciable distance from the battalion headquarters and/or training sites. Therefore, travel time to and from training sites further reduces the effective training time available during the 39 days.

Recent discussions of strategies for training National Guard FSBs have raised additional problems.

- The state and the Army sometimes issue redundant or contradictory guidance which tends to add training requirements that take time away from unit combat training.
- Individual duty MOS training is frequently of low quality because:
 - there is a lack of quality control to ensure that performance is trained to Army standards, and
 - there is little training that is driven by realistic scenarios which hinders the ability to reinforce the Army standard of performance.
- Often National Guard maintenance company personnel are not given access to the actual equipment to be maintained. This lack of realism inhibits effective training.
- Many National Guard FSB personnel are not given access to the automated systems that the Army uses to order parts. Some states use their own procedures, so the National Guard personnel are not trained on the Army systems.

Two key initiatives have been directed to address these problems.

- Bold Shift, which provides additional Active Component support for National Guard unit training.
- Congressionally-mandated development of improved training within the constraints faced by Guard units, particularly the geographic distribution of the guardsmen, through the use of advanced computer based technologies. The Army National Guard and the Advanced Research Projects Agency are cooperating in the development of this technology; one focus of this development is on improved training for National Guard FSBs.

Annual Training for the ARNG is usually conducted at sites where terrain, material, equipment, Opposing Forces (OPFOR), and training expertise (AC & ARNG) are present for high quality training. The quickest payoff in improved readiness will therefore be achieved by focusing on Inactive Duty Training (IDT) at the unit home station (armory), where these conditions seldom exist. The Army National Guard (ARNG), and the Advanced Research Projects Agency (ARPA) Advanced Distributed Simulation Program have initiated the development of distributed, multimedia, (paper-based and computer-based) individualized instruction. The present project is a part of this larger effort and will develop prototype computer-based instruction (CBI) for FSB staffs and critical individual and section/team training for the FSB supply, maintenance, and medical companies.

C. Related Efforts

Two allied training efforts were initiated concurrently with the FSB effort described in this document.

- ***National Guard Combat Battle Staff Training, Fort Benning, Georgia.*** This effort will develop CBI for the Battle Staff of combat battalions. The training developed in the Fort Benning effort will be used as a foundation for the FSB Battle Staff training to be developed at Camp Dodge. In addition, the look, feel, and function of the CBI developed at both Fort Benning and Camp Dodge will be closely coordinated.
- ***Army National Guard Training, Fort Knox, Kentucky.*** This effort will rely heavily on simulation to develop computer-based training for National Guard armor units. Much of the Battle Staff training that will be developed by Fort Benning, and then tailored for use with the FSB battle staff by Camp Dodge, will be based on the scenarios that will be developed by Fort Knox.

Careful and constant coordination will occur between these three efforts to ensure that the training developed is both consistent and complimentary, forming a solid training base for National Guard Battalions.

D. Furnished Data/Property

- The government will provide to the contractor personnel at the site: office space, desks, chairs, telephones, general office supplies as available, storage space for tools and test equipment, AC power outlets for tools and test equipment, and access to paper copier and telefacsimile service at Camp Dodge, Iowa.
- Access will be made available to ARI Battlestaff (task 2123) findings and current research activities, IDA reports and current research activities, and Iowa ARNG findings and activities. In addition, the government will provide the contractor

with copies of the most recent training materials related to the MOSs and staff positions for which training is to be developed.

- BDM Federal will provide all automated system equipment, to include training developer work stations, courseware authoring stations, student and instructor work stations, and required software.
- Telecommunication equipment and support services will not be provided by BDM. Office supplies, as needed, and mailing services will be the responsibility of PRC, Inc.
- ARPA -- Camp Dodge Support Team will provide development of critical tasks for FSB company collective (lanes) and individual training. This team will serve as military subject matter experts and will provide subject matter content for the development of the training in this contract.

II. TECHNICAL OVERVIEW

This section describes the technical approach to be used by the Camp Dodge team to develop the FSB staff and company prototype training. General concepts will be covered first followed by the technical objectives. Then the instructional delivery concept and procedures for developing instructional content will be discussed.

A. General Concepts

The training level terminology, battle focus training concepts, and lane training procedures are an integral part of the technical approach to this training development. They are discussed in detail in the following paragraphs.

1. Training Levels. Three levels of training, termed simply "crawl," "walk," and "run," will be addressed in this training program. Although there is no formal Army definition of these terms, they are used in many circles throughout the Army to define the operational tempo (OPTEMPO) of training, based on the competency level of the soldier.

Training at the "crawl" level is very basic and is task -- rather than time-oriented. The training is free of distractors, and is repeated until the task can be done correctly. This training requires considerable guidance from the trainer. Training at the "walk" level incorporates a combat scenario to illustrate when and under what conditions the task is to be accomplished. Instructor guidance is decreased as student proficiency levels rise. Training at the "walk" level continuously intensifies to reach a level where the soldier can successfully do the task under full combat conditions. "Run" level training is accomplished under fully simulated combat conditions at full speed. Instructor guidance is minimal and is usually provided only in an After Action Review (AAR) format. (See Appendix G of FM 25-101 for AAR procedures.)

This effort will develop CBI training at the "crawl" and "walk" levels, which will prepare the soldier for "run" training in a fully resourced, collective, hands-on exercise at a weekend training site, a Command Post Exercise (CPX), a simulation center such as Fort Knox, or a Combat Training Center (CTC) such as Fort Irwin.

2. Lane Training. "Lane training" described in Chapter 4 of FM 25-101, is a technique designed primarily to train company teams and smaller units in a series of selected soldier, leader, and collective tasks in a combat scenario. The scenario is designed to cue accomplishment of selected tasks.

A "lane" is a logically ordered set of tasks directly related to the mission of a team/unit. Each "lane" provides soldiers the opportunity to learn and demonstrate mastery of specific tasks that have been determined essential to the accomplishment of the unit/team's mission. The specific tasks that comprise a "lane" are designed to maximize the unit's overall readiness as related to realistic team/unit activities in a combat situation.

As an instructional strategy, this training model offers significant advantages for this training program. "Lane training" provides ways in which the learners can link new information to existing prerequisite knowledge. It offers an inherent platform which gives the learners ways of organizing new skills so that they can be stored with relevant existing knowledge and thus be retained more easily. Also, because of the chronological nature of the "lane", it provides a built-in structure that logically provides the building of subordinate skills in an active mode which increases the motivation of the learner.³

Upon completion of a "lane" by an individual or a team, performance to standard is measured. Immediate feedback in the form of an AAR is provided. "Lane training" is tailored to the unit's needs by the commander, allowing him to emphasize the tasks most important to the unit's overall readiness. "Lane training" is a highly developed practice in combat and combat support units such as Armor and Artillery.

Lane training, therefore, is not new to the Army, but its application in CSS units (e.g. supply, maintenance, and medical units) has been less developed and practiced. Set up and management of CSS lanes is usually more difficult than combat lanes due to the complexity of equipment, manpower, and time requirements. The ARPA Support Team at Camp Dodge reviewed CSS lanes at Fort Stewart (218th Separate Brigade) during Annual Training. Although these lanes provided good training they were extremely resource intensive. To conduct CSS lanes training at National Guard (NG) armories is even more complicated due to the geographic spread of the armories, and the limited number of full-time staff available for coordination and setup. For many NG units, the resource requirements for conducting hands-on lanes are just too great to conduct lanes during IDT. Many times, this results in the unit shifting its training focus to tasks that can be resourced, but are not battle-focused. The execution of this training may even be excellent, but precious training time is wasted because higher priority training is not being conducted.

³Dick & Carey, *The Systematic Design of Instruction*, (1990)

One NG organization (Iowa) has demonstrated major success in applying the lanes training procedures to CSS units. This success started with a top-down (Adjutant General, State Director Staff, Support Group Staff and CSS Battalion Staff) emphasis and resource allocation. This cleared the way for the development of lanes training in the CSS units armories and at Camp Dodge.

The Iowa National Guard's experience demonstrated that with limited training time, the quickest results in improved readiness would result from grouping tasks into combat scenarios as soon as possible. Hands-on training (to the extent possible) improved results. Group dynamics also improved the performance of new members of the group (section/team), who learned quickly by the example, demonstration, and encouragement of their peers, in addition to the leader's guidance. Esprit de corps, even at section level, added momentum to the learning process.

Lanes training was found to be particularly effective with maintenance units. One specific example is the 3654 Maintenance Company -- Direct Support (DS). This unit was activated during Desert Storm and provided backup DS maintenance at the National Training Center (NTC) for the 48th Brigade, GA ARNG, who were undergoing extensive combat trainup following their mobilization. The 3654 was able to maintain Force-Mod equipment (M-1 Abrams tanks and M2/M3 Bradley Fighting vehicles) with virtually no trainup after their activation and deployment. Their successful performance can be credited in great part to effective execution of Force-Mod lane training during the Pre-Mobilization period. Effective training is a leading factor in the retention rate of National Guard units. The Maintenance Battalion rose from the poorest retention rate in the state to near the top upon implementation of lanes training.

The National Guard Bureau (NGB) established their Equipment Maintenance Center -- CONUS (EMC-C) -- at Camp Dodge. This training center for General Support (GS) maintenance units was designed around the lanes concept. The center opened in October 1992 for annual training of National Guard and Army Reserve units. Their mission is quality training to standard, with a by-product of repaired Force-Mod equipment they rebuild as a part of this training. Many active army senior officials have visited the site and were so impressed that some are unofficially calling it the "national training center for maintenance." (The newest initiative is to establish a similar center for Direct Support maintenance units using the same concepts.)

As effective as they are, CSS hands-on lanes were still found to be very difficult to conduct in unit armories. Many are located in urban areas with limited terrain available, and also lack the military maps of the region which are used for realism. Large equipment such as M-1 tanks or M2 Bradley Fighting vehicles are difficult to obtain and may be impossible to deliver to the armory because of highway restrictions. Heavy manpower support of the lanes is also required, taking valuable time away from their own readiness training (e.g., soldiers dressed with moulage kits for medical lanes get marginal training benefits). A heavy price in time and effort is also paid by the limited NG full-time staff in lane setup. After setting up a complex lane, a weekend training assembly has only two days in which to operate the lane -- limiting the recycle time available to those teams that do not reach the accepted standard. In view of these factors, the Iowa National Guard's success is even more remarkable, since a continual commitment throughout the chain of command is required to maintain this important training. Even in Iowa, travel is required by the unit to execute many lanes.

This effort will develop prototype CBI training modeled after effective CSS lanes. Units will be able to conduct the CBI in any armory with virtually no setup time required. The CBI training will be presented at the "crawl" and "walk" levels and will enable the team to train at the "run" level in a hands-on lane when they are at an appropriate training site.

3. Battle-focused Training. Battle-focused Training is training on tasks that the unit must do on the battlefield. To ensure that a given task is required for a specific unit, a battle focus analysis is done by all levels of command. The procedures for this analysis are outlined in Chapter 2 of FM 25-100.

The analysis begins with the unit's Mission Essential Task List (METL). This broad list of company tasks is then broken down into component collective tasks for each subordinate section and team. This is done by using the appropriate Mission Training Plan (MTP). The next step is to identify the individual soldier tasks that support the collective tasks, using the Soldier Training Plans (STP) and Military Qualifications Skills (MQS) for each Military Occupational Specialty (MOS) in the unit.

The analysis must take into account Standard Operating Procedures (SOPs) and doctrinal publications, since special command-related requirements must also be met. The battle-focused list of individual soldier tasks may add or delete from the soldier's STP. For example, the medics in the ambulance team must be qualified drivers whereas they are not required to prepare medical operation rooms.) In the Army, it is expected that the unit's battle-focused training program will provide the training not otherwise provided in the schools or doctrinal programs.

The tasks are then prioritized from METL through collective to individual tasks. This prioritized list then becomes the unit's battle focus. The unit then has their combat mission clearly identified and the order of criticality for training defined. This process of paring down the tasks to be trained is critical to the NG. NG units cannot afford to train on tasks, whether collective or individual, that are not battle-focused unless specifically ordered by higher command. (An example is the civil disturbance training required for some National Guard units).

The battle focus analysis and the update required is very time consuming for a unit commander in the NG who has very limited full-time staff. It has a high payoff, however, because selection of tasks for training will be appropriate for the unit's mission on the battlefield and progress toward combat readiness can be documented. The ARPA Support Team of Camp Dodge has completed a battle-focus analysis for the supply, maintenance, and medical units of the FSB/Support Battalions. This analysis will be used to develop the CBI for the FSB companies of this contract.

B. Technical Objectives

The Technical Objectives of the Camp Dodge team are:

1. To develop prototype FSB staff functional area training courses for ARNG use at home or in the armory. These courses will guide the FSB staff through the

"crawl" and "walk" levels of competency in the management and synchronization of CSS in the Forward area. These skills will provide the staff officers the primary building blocks required for subsequent "run" level training in simulation or hands-on exercises at appropriate training sites (including CTCs). The ARPA staff will screen the staff courses developed by the Fort Benning team for ARNG battle staffs and use as much of this material as possible for the course content of the FSB staff courses. The contractor furnished educational specialists will maximally incorporate the courseware developed by the Fort Benning team modifying as directed by the ARPA staff. Then the CBI will be integrated into the CBI Training Management System (TMS). Selected staff training will be developed for the following officers and non-commissioned officers:

FSB

Executive Officer - 03A00
Battalion S1 - 03A00
Battalion S2/3 - 03A00
Support Operations Officer
(SPO) - 03A00
Battalion S4 - 03A00
Intelligence NCO - 96B

SPT BN

Executive Officer - 03A00
Battalion S1 - 03A00
Battalion S2 - 03A00
Battalion S3 - 03A00
Brigade Material Management
Officer (BMMO) - 03A00
Battalion S4 - 03A00
Intelligence NCO - 96B

2. To develop prototype individual and team/section training courses for the FSB medical, maintenance and supply companies. The training developed will be modeled after effective lanes training for CSS units.

The ARPA staff selected the lanes for prototype development based on an analysis of the test organizations⁴ METLs and their commanders' priorities for training. A battle-focus for each company was then completed in accordance with the steps outlined in FM 25-100 and 25-101. Then they identified and prioritized a list of tasks for potential CBI development based primarily on the criterion "difficult to train in the armory."

The educational specialists then reviewed the tasks selected for CBI and projected development time within this contract period. Together the ARPA staff and the educational specialists will develop lesson organization, concur on CBI presentation strategies, simulation where feasible, and testing. The educational specialists will then develop the CBI and integrate it into the TMS.

The CBI training will be designed for use in an armory during Inactive Duty Training (IDT), will produce skills necessary at the "crawl" and/or "walk" levels to enable the soldier to

⁴Test organizations for this effort are the 145th FSB, ID ARNG and the 148th Support Battalion, GA ARNG.

train at the "run" level in a hands-on lane at an appropriate training site. Selected unit training will be developed for the following officers, non-commissioned officers (NCO) and soldiers.

Officers**

HHD Commander - 03A00
 Co A (Supply) Commander - 92A00
 Supply Platoon Leader - 92A00
 Co B (Maintenance) Commander 91B00
 Maintenance Platoon Leader - 91B00
 Co C (Medical) Commander - 62B00
 Executive Officer - 67B00
 Platoon Leader - 67B00

NCOs* and **

Maintenance - 63H
 Maintenance - 63Z
 Fuel Supervisor - 77F
 Medical Supervisor - 91B
 Intelligence NCO - 96B

Soldiers (SL 1/2)*

Tow/Dragon Repairer - 27E
 Radio Repairer - 29E
 Turret Repairer - 45K
 Track Vehicle Repairer - 63H
 Fuel Specialist - 77F
 Medical Specialist - 91B

* Priority Company Lanes

** Defend Company Sector

C. Instructional Design Concept

The design concept is the overall principles that will guide the design and development of each CBI lesson. In the following paragraphs, the design concept for the FSB units is discussed in detail, and the concept for the FSB Staff training is summarized and referenced. Also included is a step-by-step summary of the process that we will use to translate the concept into product.

1. **Design Concept for FSB Unit Training.** The design concept for the FSB unit training is based on four principles:

- job focus
- progressive learning difficulty
- behavioral focus
- learner control

This concept is well-grounded in instructional and learning theory. Each of the four principles of the concept are discussed in the following paragraphs. Included in each discussion are the theoretical basis for the principle, and a description of how the principle translates into the design features of the FSB CBI.

Job Focus. The ultimate foundation for lanes-based training is job focus. In the case of FSB training, the job focus is equivalent to battle focus. From the perspective of the soldiers taking the training, a lane is a collective task that they will almost certainly have to perform if they are ever sent into a battle situation. As such, it is easy for those soldiers to see why they need to learn how to accomplish their part of that task. While taking this training, students will be fully aware of the lane for which they are training, and will be shown how their learning fits

into and prepares them for that lane. Additionally, situations and scenarios used in the training will be realistic and battle-focused. As stated by John Keller,⁵ students will be motivated to learn if they understand the relevance of the skills included in the instruction. In addition, behavioral/associationistic learning theory indicates that presentation of learning in an environment which resembles the "real world" (i.e., the job environment) facilitates transfer of skills to the job.⁶ The job-focused nature of the FSB CBI based on the lanes approach should increase learning, retention and application of skills in the field.

Progressive Learning Difficulty. The FSB CBI design concept centers around a four-level training approach. This approach is consistent with behavioral learning theory assertion that training should proceed from simple to complex,⁷ and is based primarily on two elements of the cognitive learning theory, namely, that learning is:

- The gathering and ordering of facts into concepts and then the building of concepts into principles
- A hierarchical process where the development of knowledge and understanding precedes development of skill application and problem-solving which, in turn, precedes the acquisition of synthesis and evaluation thinking skills^{8,9}

In the FSB unit training, the first level of training consists of mastery of individual basic skills and basic application of those skills to job-focused situations. Level two progresses to application of multiple basic skills to the problem-solving process. This level will be achieved by placing the student in battle-related situations and challenging the student to successfully work through the situation. During this process, the computer will supply guidance and feedback, and will simulate the activities of other people involved in the situation. Level three will involve the student at the synthesis level of learning as the student is required to apply skills to problem-solving as a part of a group exercise. Essentially, this level will be a computer-generated and computer-run lane simulation. Ideally, this level of training is intended to be delivered to a team of students which includes all personnel required to conduct the collective task -- the leader and all required soldiers. Because the ideal situation may be uncommon, however, the CBI for this level will be designed to function in three modes -- all required team members, leader only, and soldiers only. In the latter two modes, the computer will "play" the parts of the missing team

⁵J. Keller, Strategies for stimulating the motivation to learn. *Performance and Instruction*, 26, (8), 1983, pp 1-7.

⁶B. R. Hergenhahn, *An Introduction to Theories of Learning*. 1976, pp 349-351.

⁷B. R. Hergenhahn (1976)

⁸B.S. Bloom, *Taxonomy of Educational Objectives: The cognitive domain*. New York: Donald McKay, 1964.

⁹Hall, Keith A., *Content Structuring and Question Asking for Computer-Based Education*, *Journal of Computer-Based Instruction*; v10 n1-2 p1-7 Sum 1983

members. Level four consists of actual hands-on conduct of a training lane. While this level does not fall within the scope of this project, it is a constant influence on the design decisions that are made for levels one through three. Since level four is the ultimate training environment for FSB unit training, the goal of levels one through three is to prepare students to get the most out of level four training, and thereby increase the effectiveness of that training and the chances of successful application of learned skills in the field.

Behavioral Focus. Consistent with behavioral learning theory, all FSB CBI training will apply stimulus-response-feedback loops to elicit observable behaviors or performance. This will be accomplished by integrating the guidelines developed by Hergenhahn¹⁰ and Skinner¹¹ for the application of behavioral learning theory to CBI with the instructional events that adherents of cognitive learning theory recommend be included in CBI instruction.^{12,13} This integration of behavioral and cognitive theory results in design features that focus on creating an environment that emphasizes an active, informed, self-motivated and self-directed learner. These features will be used throughout the training and include:

- Obtaining/stating clear, detailed behavior objectives
- Developing a series of information frames that expose the student to material in ordered, graded steps of increasing difficulty, accompanied by question and answer frames that frequently retest the same information from different angles
- Providing stimuli in the learning environment that resembles the "real world," in order to facilitate learning transfer
- Requiring an active learner response every frame or two
- Providing immediate feedback for each response
- Arranging the material and questions in such a manner that the correct response is likely to occur and be reinforced (avoid errors)
- Permitting students to proceed at their own pace
- Providing ample backup reinforcement for effective work

¹⁰B.R. Hergenhahn(1976)

¹¹B. F. Skinner, "programmed learning," as summarized in J. Chambers, *Computer-assisted Instruction*. Prentice-Hall, 1983.

¹²Gagne, R. M., The Conditions of Learning, (2nd ed.) 1970.

¹³Cook, E. K.; Kazlauskas, E. J., *The Cognitive and Behavioral Basis of an Instructional Design: Using CBT to Teach Technical Information and Learning Strategies*, Journal of Educational Technology Systems; v21 n4 p287-302

Student control. The final principle in the design concept is that of student control. The importance of student control -- both rate and path of learning -- in adult learning is stressed in behavioral learning theory.¹⁴ The FSB courseware will be designed to implement this principle by maximizing flexibility of use. Students can enter courses in two modes: prescribed training or refresher training. In the prescribed mode, students will encounter the only restriction on the use of the courseware -- before taking each lesson, they will be required to take the appropriate lesson pretest. The results of each pretest will be recorded and used to give the student guidance concerning which topic(s) to take. Guidance will be based on which lesson objectives the student "passed," and will range from advice to take all topics in the lesson (preferably in the order shown on the menu) to permission to skip all topics. After completion of the pretest, students will be allowed to take any or all lesson topics in any order, any number of times. Successful completion of the lesson will require a passing score on either the pretest or post-test.

In the review mode, the student will be allowed to take any topic of any lesson at will. An index of topics will be available at all menu levels and will allow the student to search for a specific topic and access that topic from the index. Additionally, all job or training aids that are available from within the lessons will also be directly accessible from all menu levels. (Planned aids include: a "tool box" containing graphical representations of special tools used in maintenance, a "first aid kit" which explains basic first aid procedures, a glossary of terms and acronyms, and selected publication extracts. A variety of other tools are under design consideration.)

2. Design Strategies for FSB Staff Training. The objective of the FSB staff courseware is to prepare each officer for his or her role in developing the Forward Support Battalion Order. The courseware will be modeled after that devised for the maneuver battle staff. For a complete discussion of that effort, see Appendix A -- Extract -- Program Development Plan, Battle Staff Training System Development.

The courses for the FSB staff will be presented on a CD ROM and will be downloaded on a PC which can be used at home or in the armory. A mentor or training manager will be provided at the unit for expertise and assistance. They will be in contact with students on a bulletin board system for questions/answers. This system will also put them in contact with other staff officers for the staff coordination that is required in the development of the Battalion Order. When the staff has completed the training, they will be ready to effectively progress to collective staff training at full pace in a CPX, simulation center, or CTC .

3. Implementing the Concept -- the Systems Approach. To implement the design concept, the development team will use a systematic model for the design, development, implementation and evaluation of instruction. The following is a step-by-step description of this process.

¹⁴B. F. Skinner(1983)

- 1) The instructional goal has been identified as improving the training significantly for the Forward Support Battalion.
- 2) We are using the rules and concepts outlined by the ARPA support team to conduct an instructional analysis. An information processing analysis will be used to describe, in a step-by step fashion, exactly what a person would be doing when performing the tasks.
- 3) We will identify specific prerequisite skills that trainees must have before beginning instruction.
- 4) Performance Objectives will be developed indicating skills to be learned, conditions under which the skills must be performed, and criteria for successful performance. These objectives will be developed incorporating Kirkpatrick's four levels of criteria¹⁵ used to evaluate training programs (Reaction, Learning, Behavioral, Results). We will aim our objectives toward behavioral and results-oriented outcomes.
- 5) We will develop criterion-referenced test items that will be reviewed for consistency, stability, accuracy and precision. All exams will be checked for their reliability and validity. Our test items will also follow Kirkpatrick's evaluation levels.
- 6) Instructional strategies will be designed with the "crawl," "walk" and "run" concepts in mind. The CBI lessons will be developed at the crawl and walk levels. Simulations will be widely used, since according to Coppard, simulations usually enhance cognitive skills, particularly decision making.¹⁶
- 7) We will develop/produce instructional courses.
- 8) Our team will design and conduct formative evaluations by collecting data through one-on-one, small-group, and field evaluations. These evaluations will be done continuously throughout the project.
- 9) The data from the formative evaluation will be summarized and interpreted to attempt to identify difficulties experienced by learners. We will use this information to reexamine the validity of the instructional analysis and the assumption about the prerequisite skills. Revisions will be made accordingly.
- 10) The last step will be summative evaluation, which occurs only after the instruction has been formatively evaluated and sufficiently revised to meet the standards of the designer.

¹⁵Kirkpatrick, D.L. (1976). Evaluation of Training. In R.L. Craig (Ed.), *Training and Development Handbook* (2nd ed.). New York: McGraw-Hill.

¹⁶Coppard, L.C. (1976). Gaming simulations and the training process. In R.L. Craig (Ed.), *Training and Development Handbook* (2nd ed.). New York: McGraw-Hill

D. Developing Instructional Content

Two broad areas of individual soldier and leader training will be developed in the Camp Dodge effort. The first is for the battalion staff and the second is for the medical, supply and maintenance companies of the support battalions. There are two types of support battalions that the training developed under this delivery order will address: the Forward Support Battalion (FSB) that serves the task forces in a Brigade that is subordinate to a Division, and Support Battalions which are organic to 'Separate Brigades.'¹⁷ Differences include size and density of MOSs and considerable operational differences. For example, an FSB typically has approximately 400 soldiers while a Support Battalion, Separate Brigade has approximately 800; an FSB has two Motor Transport Operators (MOS 88M) and a Support Battalion has 65. (Note: The term "FSB" generally will refer to both type units in this plan. Support Battalion will be used when specifically required.)

Instructional content will be a combination of paper-based material, VCR tapes and computer-based instruction. The selection of training delivery medium will be based on what medium will be most effective in training the individual soldier, leader, staff officer, section or team. e.g. a track vehicle mechanic must be able to use technical manuals effectively and in the foreseeable future will retain paper-based documents for use in the field. This training will require use of TMs in connection with computer-based instruction.

Computer-based instruction will include a Training Management System (TMS) that provides a course map for the logical progression of training. In addition, the TMS will be used to facilitate use of other (e.g. paper-based) material through quizzes, tests and practical exercises. Computer-based instruction will focus on tasks that are difficult to train in the armory and on staff concepts that are difficult to master by merely reading about them.

Student and instructor guides will be developed to tie all the media together as well as providing references for training remediation.

1. Training for FSB Staff. Three factors will contribute to the coordination of the staff training development efforts for the FSBs and for the maneuver task forces.

First, we propose to use common "cornerstone" missions. These will be real missions which were run at the NTC. Data in the Combat Training Center (CTC) Archive at the Presidio of Monterey will enable us to develop a complete supporting package of orders and contextual material to drive each scenario.

Second, the training developed for maneuver staffs through the Fort Benning effort started somewhat earlier than the present Camp Dodge effort, and will be able to provide some materials for review and tailoring, which will streamline development of FSB materials. Of course, the difference in orientation of some of the staff, and positions unique to the FSB staff (e.g., SPO

¹⁷One of the two brigades designated as 'experimental' units for field trials of the computer-based instruction is an FSB, while the other is the Support Battalion to a separate brigade.

and BMMO) will necessitate tailoring of the maneuver staff training materials. Some of the basic skills material may require very little modification, while material on collective tasks may require extensive modification. Tailoring will also be needed to accommodate the two types of support battalion staffs.

Third, there has been, and will continue to be, extensive coordination about the "look and feel" of the courseware to be developed. The two training development efforts will use the same hardware and software systems and adhere to the same courseware development standards.

FSB Staff Courses. Staff courses developed by this effort will be appropriately tailored from the maneuver staff courses to fit the FSB mission. Although many staff actions and procedures are identical throughout the Army there is a marked difference in how logistics staffs are structured compared with combat battle staffs. This leads to a different mix of responsibilities and coordination for individual staff members. The mission of the unit and their relative position on the battlefield also determines the problems the FSB staff must resolve. Hence terminology, examples, and problems in courses must relate directly to the FSB for maximum effectiveness of training.

The FSB does not perform aggressive combat. Rather, they defend logistics areas. They push their supply, maintenance, and medical support forward for use by combat and combat support units. The FSB staff assists in the development of the Brigade Order, develops their own internal Battalion Order, and develop External SOPs to effect smooth coordination with supported units.

The staff structural comparison is shown in Table 1. On the left is the Maneuver Battalion Staff. On the right is the FSB and Support Battalion Staffs and the unit commanders. It should be noted that Maneuver Staffs have S3 Air, FSO, ADA, Engineer, Signal, and Chemical Officers, whereas FSB/Spt Battalion Staffs have none. These functions are integrated into the duties of others if required. The FSB has a combination S2/3 and a SPO that manages mission intelligence and operations. The Support Battalion has separate S2, S3, and BMMO for the same purposes. Here major development will be required by the Camp Dodge ARPA staff and educational specialists. The Executive Officer, S1, and the S4 have nearly the same duties across all units. For these positions, although most of the courseware can be adopted by the Camp Dodge team from the Fort Benning courseware, there may be semantic changes needed to ensure applicability to the units involved.

Maneuver Battalion			Forward Support Battalion			Support Battalion		
Staff Position	Responsibilities		Staff Position	Responsibilities		Staff Position	Responsibilities	
Exec. Officer	Staff Supervision		Exec. Officer	Staff Supervision		Exec. Officer	Staff Supervision	
S1	Internal - Personnel		S1	Internal - Personnel		S1	Internal - Personnel	
S2	Internal - Intelligence (Enemy, Terrain, Security, Weather), Combat Area		S2/3	Internal Forward Support Battalion Operations (Operations, Intelligence, Security, Training)		S2	Internal - Intelligence (Enemy, Terrain, Security, Weather), Support Area	
S3	Internal Combat Operations					S3	Manages Supply, Transport Maintenance, and Medical through three assistant S3s	
S3A/ir	Combat Air Operations							
S4	Internal - Logistics		S4	Internal - Logistics		S4	Internal - Logistics	
			SPO (Support Operations Officer)	External - Manages Supply, Maintenance and Medical Support to Brigade; Coordinates Transport and Field Services		BMMO (Brigade Material Mgmt. Officer)	Manages Supply and Maintenance; Controls Property Book	
FSO (Fire Support Officer)	Plans and Coordinates Fire Support Operations		Forward Support Battalion			Support Battalion		
Air Defense Officer	Plans and Coordinates Air Defense Artillery Support Operations		Cdr Co A Supply Co	Receipt, Storage, Issue Class I, II, III, IV, and VI and Transload Class V for BDE		Cdr Co A Supply and Trans Co	Provides Supply (Including Water), Service and Transportation Support to the Brigade	
Engineer Officer	Plans and Coordinates Engineer Operations		Cdr Co B Maint Co	Provide DS Maintenance, Common Repair Parts and Provide Limited Backup Recovery to BDE		Cdr Co B Maint Co	Provides DS Maintenance and Repair Parts to the Brigade	
Signal Officer	Plans and Coordinates Communications and Electronics Operations		Cdr Co C Medical Co	Provide Division and Unit Level Health Services Support to all Units in BDE Area. Cdr is the BDE Surgeon		Cdr Co C Medical Co	Provides Separate Brigade and Area Support to Units in Brigade Area/ Brigade Surgeon	
Chemical Officer	Plans and Coordinates Offensive/Defensive Chemical Operations							

(Iowa Team)

(Ft. Benning Team)

Table 1: Staff Structure Comparison

The FSB Staff courses are listed below. Preliminary outlines for these courses are found in Appendix D, outlines E through M, respectively. The objective of military training is skill mastery, therefore, the total hours shown are approximate: Each student will start with different skills and knowledge and will progress at a different rate. The CBI hours shown in the list below (and in Appendix D) are the estimated hours of CSS specific material to be developed by the Camp Dodge Team. In addition, the Camp Dodge Team will review all of the material (CBI and other) prepared by the Ft. Benning Team and make adjustments so that it represents the proper context for training FSB Officers.

COURSE	PRELIMINARY COURSE OUTLINE	ESTIMATED CBI HOURS	ESTIMATED TOTAL HOURS
-FSB/Spt Bn - Staff Common Core Subjects	E*	4	24
-FSB Support Operations Officer (SPO)	F**	10	50
-FSB S-2/3	G*	2	40
-Spt Bn S2	H*	2	40
-Spt Bn - Brigade Material Management Officer (BMMO)	I**	#12	50
-Spt Bn S3	J*	2	40
-FSB/Spt Bn S1	K*	2	26
-FSB/Spt Bn S4	L*	2	30
-FSB/Spt Bn Executive Officer (XO)	M*	5	20
Total Hours:		33	320

* To be developed in coordination with Fort Benning Team.

**To be developed by the Camp Dodge Team.

#Note: 8 hours of BMMO CBI will be the same as SPO.

Table 2: FSB Staff Course List

2. Training for FSB Companies. This effort will develop CBI to support battle-focused lanes for each company, based on the highest priority collective missions and the tasks most difficult to conduct at the armory location.

Lane Training. Basically, a lane represents a collective task usually conducted hands-on that supports a Mission Essential Task from the unit's METL. Lane training could be developed to support all collective tasks and sub-tasks in a unit. One advantage of the lane training strategy is that individual and leader training can be accomplished in a collective training context. The supporting individual soldier and leader tasks that are critical to the accomplishment of collective tasks are trained in the lane. The conditions under which the training is performed are designed to represent a realistic tactical scenario. The difficulty of the training can be varied by changing the tactical conditions for the lane.

A lane is constructed by identifying the critical individual and leader tasks in the appropriate STP and MQS publications that relate to the collective task for the lane. A critical

individual or leader task would be one that, if not executed properly, would severely impact on the accomplishment of the collective task. Applying this filter reduces the number of tasks to be trained to support the critical missions of the unit. It also ensures that the most critical individual and leader tasks are trained first. This process of paring down the tasks to be trained is critical for the Reserve Components (RC). RC units cannot afford to train on tasks, whether collective or individual, that are not battle-focused.

For example, the medical company lane under development in this effort combines 12 critical leader tasks and 58 critical individual tasks. (For a schematic of the Lane see Figure E-1.) This collective task is: Provide ambulance evacuation support. It supports the high priority Mission Essential Task: Perform health service support operations, from the unit's METL.

The lane is designed for an NCO leader and an ambulance team and is required for all ambulance teams in the ambulance platoon of the unit. This lane begins with a request for medical evacuation. The leader delegates the mission to an ambulance team, directs the team where to go to receive the patients, selects an ambulance exchange point and maintains communication with the team. The ambulance team deploys to the location and selects and marks the helipad. The medics triage and treat casualties, and initiate the field medical card for each patient. The team then selects transportation to an appropriate treatment center and coordinates for helicopter evacuation. Patients are moved to an ambulance exchange point and care is administered enroute. Patients are processed through an ambulance exchange point -- ground/air. Direct exchange of medical equipment activities are completed. Defensive procedures are implemented. Then the ambulance team prepares for a new mission by inspecting, inventorying, and replenishing supplies as needed. The level of difficulty of the lane is increased by conducting the hands-on lane at night, and/or under chemical or enemy ground/air attack.

FSB Lane Development. The conduct of a battle-focused lane in the hands-on mode is a major training goal for the unit. This lane, fully resourced, with simulated battlefield conditions at "run" level should be at least an annual event. The medical lane described above would be difficult, however, to conduct in most armory locations. It would require time, helicopters, ambulances, terrain, patients prepared with moulage kits to simulate injuries, communications and evaluators/observers/controllers. This training would be more effectively planned for an AT site or a Multiple Unit Training Assembly (MUTA)5 at a major Weekend Training (WET) site.

This effort will develop a multi-media training package which breaks the training into logical, progressive blocks that can be conducted at most armory locations. This training package will provide "crawl" and "walk" training in preparation for the fully resourced "run" lane. This will maximize the use of time during IDT and the training value of the "run" lane.

An integrated multi-media approach to lane training will be presented in the form of a course map. Each task to be trained will be included on the map, along with the recommended methods for training the task, based on the resources usually available in an armory environment (e. g., hands-on where possible, television tapes (TVT) where the resource is most appropriate, CBI, Electronic Information Delivery System (EIDS) where this resource is current and high

quality or paper reference where other higher quality resources are not available. CBI will be developed in this effort to support the lane where tasks are too resource-intensive to train at the armory during IDT. The Training Management System (TMS) developed by this effort, will track the progress of individuals and sections throughout the training. (TMS is discussed in Section III, Task 2 and Appendix B.)

Figure 1 shows the three major phases of the Lane Training Methodology. The first phase (crawl) involves leader and individual training on tasks critical to the collective mission of the lane. The second phase (walk) involves practical exercises to be performed by the unit/team to synchronize the application of their individual skills. The third phase (run) is a fully hands-on lane training exercise designed to allow the unit/team to attain Army standards under field training conditions. Training managers will schedule training for the students in accordance with guidance from their commanders, to include the assessed training status of the individuals and units and the availability of training resources. Students may be routed to CBI, hands-on training, or other training opportunities. Generally speaking, the CBI will be directed at individual-level skills, however, some will also be developed for certain phase two skills.

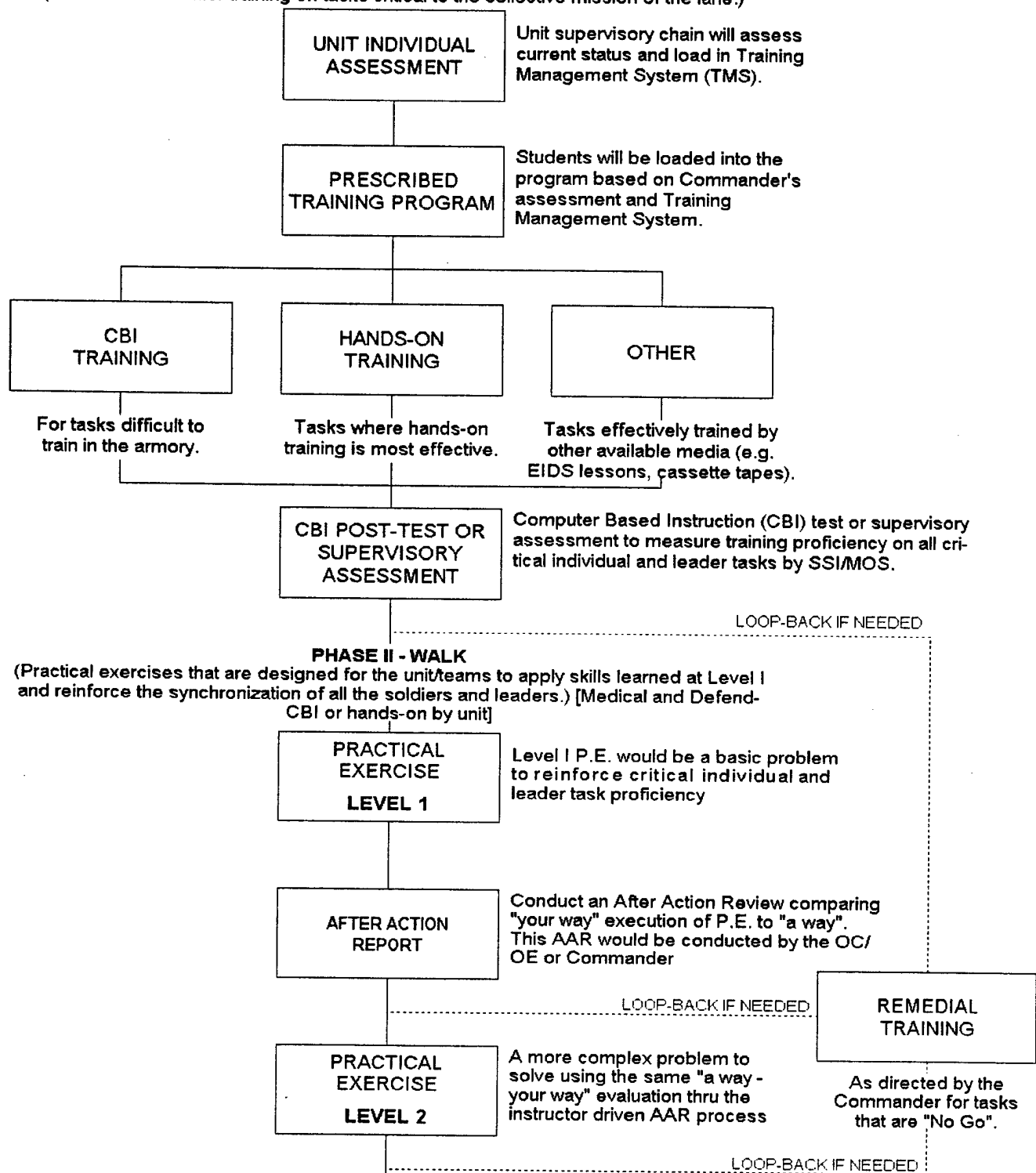
The ARPA Support Team at Camp Dodge completed a battle focus analysis of the supply, maintenance, and medical units of the FSB. They then prioritized the tasks, with input from both test battalions and an analysis of data from the CTC Archive (TRACS) and the Center for Army Lessons Learned (CALL). Then an analysis was made based on the difficulty the unit has in conducting the task at an armory during IDT.

This procedure resulted in the identification of a priority collective task (i.e., lane) for each company of the FSB, along with a common Defend Company Sector lane. These lanes are targeted for CBI support. The first column of Table 3 indicates the priority lanes. The number of critical leader and individual tasks to be supported by CBI and other means are shown in the second column of Table 3. In addition, the Camp Dodge Team will develop two walk-level (phase two) lanes in CBI format: One covering the content of the Provide Ground Ambulance Evacuation Support Lane (Medical Company) and one covering the content of the Defend Company Sector Lane. These 'CBI-lanes' are prototypes designed to assess how effectively unit/team skill integration can be instructed in the CBI format. The estimated training hours are shown in the third column of Table 3, again separating CBI-supported hours from the others. These estimates are based upon successful completion of each phase in one exposure to the instruction.

The battle focus analysis for the Supply, Medical and Maintenance companies is shown in Appendix E. The METL for all units is shown on page E-1. The priority Mission Essential Task is marked (*). The collective supporting tasks for the Supply, Maintenance, and Medical units are shown on pages E-2, E-3, and E-4 respectively. The priority collective tasks scheduled for CBI lane development are marked (*). The individual and leader tasks supporting the priority lanes for supply, maintenance, and medical are shown on pages E-5, E-6, and E-7a,b respectively. This listing comprises the scope of the training to be developed by this effort.

PHASE I - CRAWL

(individual and leader training on tasks critical to the collective mission of the lane.)



PHASE III - RUN

To be conducted by the unit. This level of training is fully hands-on. It is done with all the necessary resources available, and is normally externally resourced. This training will normally be accomplished at annual training as a culmination of the lane training

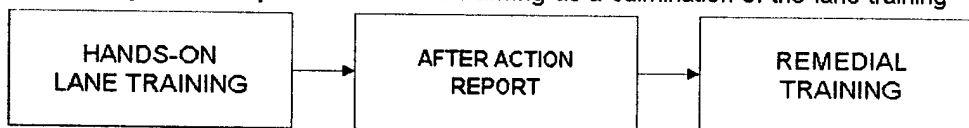


Figure 1: Lane Training Methodology

PRIORITY LANE	TASKS CBI/OTHER	ESTIMATED *TRAINING HOURS
Supply Company -Provide Class III Bulk Supplies	15/24	6/36
Maintenance Company -Provide On-site Maintenance	11/19	10/40
Medical Company -Provide Ground Ambulance Evacuation Support	20/50	10/76
Defend Company Sector	10/12	5/21
Total:		31/173=204

* Approximate Training hours are indicated only for comparison purposes. Military training is based on skill-mastery, and some students or groups advance more rapidly than others.

Table 3: Priority FSB Lanes

The TMS will track progress of soldiers through the CBI. The courseware will direct the unit through the remaining tasks to be conducted in a hands-on or other method. The hands-on tasks will be conducted as directed by the Commander. Task proficiency will be assessed by leaders in accordance with the standards specified by the STP. Task proficiency identified in "GO - NO GO" terms, will also be posted to the TMS. The TMS will then provide the Commander and training managers progress information for all tasks as needed. See Appendix G for Company Training (Lane) Course Guide.

CBI Support to the Lane Training. The program is designed with flexibility to meet varying training situations that exist in the unit. Among these are: The need to train the leader and soldiers together as a team; a leader by himself; and a soldier individually. Absenteeism, turnover of personnel, or the requirement to refresh training for the group or individuals are all circumstances that the CBI can address. Regardless of the situation, the training of soldiers is the responsibility of the first line supervisor (NCO or Officer) and the unit chain of command. Accordingly, they will be able to choose the mode of delivery that best fits their unit's situation. The CBI training is designed in two phases. Phase I is the "crawl" level individual and leader lessons that are task-oriented. Phase II is a collective training lane designed for a leader and the team at the "walk" level. To demonstrate proof of concept, this project will develop a collective, walk-level Medical Company lane and Defend Company Sector lane.

The typical chronological sequence will be to start with Phase I, the individual/leader task training, followed by Phase II, a collective lane. For each individual/leader CBI lesson, there will be a diagnostic pretest that will guide the student to the topics in which he/she needs training. Student status with respect to lessons and topics will be updated in the TMS for the use of the training manager.

When Phase I is completed (for the Medical Company and Defend Company Sector) by all members of the team, they will be ready to enter Phase II, the collective lane. This innovative training opportunity will be a CBI version of the collective lane at the walk level. This training

will be progressively intense and comprehensive so that satisfactory completion will qualify the team to enter a hands-on lane under combat conditions at a training site. The Phase II training will be designed to be used by small teams of three to five members and their leader. Typically, the leader will control the exercise and direct the CBI as he actually would on the ground. He will have the option of designating team members for responses or of holding group discussions and then eliciting a joint response. A team member or the leader will actually perform the necessary key strokes. As the team progresses through the lane, immediate feedback will be provided to reinforce learning. At the end of the lane the team will be provided with an AAR and be scored. The AAR will recommend refresher training as appropriate. Alternative uses of this collective lane are described below.

The CBI environment will also provide flexible use of these lessons and materials. Some alternatives are:

a. Phase I. The browse mode will be available in the individual and leader lessons where an individual can select specific information (e.g., job aid or specific topic) without going through the testing. This mode can be used where only limited information is needed or refresher training is the objective.

b. Phase II. The collective CBI-Lanes (one for Medical Company and one for Defend Company Sector) are designed to serve many purposes (The Lane Exercise Flow Chart in Appendix G shows the logic of these options).

- The leader will be able to simulate a Tactical Exercise Without Troops (TEWT), going through his portion of the CBI-lane before the entire team trains together.
- The team will be able to use the CBI-lane when the leader is not present. The computer will provide leader responses.
- Single soldier will also be able to use the CBI-lane with the computer providing responses suitable for all the other duty positions.

c. Multiple Uses. Although the Phase II CBI-Lanes are conceived as a way to train the synchronization of individual and leader skills, they may prove to be useful to commanders in three other ways, as well:

- The CBI-lanes could be used as a diagnostic. The commander can identify leader weaknesses and those of team members and make recommendations for training.
- The CBI-lanes could be used to introduce a new team member to the collective activity, even before he/she has had all the preliminary individual training. This helps the newcomer to establish a context for learning all of the other material.
- The CBI-lanes can be used as a refresher. This will facilitate the sustainment of skills between hands-on training opportunities.

Clearly, these uses, in combination with the three modes of use discussed above, make the CBI-lanes a potentially powerful means to train and sustain team/unit skills.

E. Authoring of Courseware

The educational specialists and the ARPA Support Team will jointly design the lesson/courses, including identification of non-CBI materials (e.g. maps, Technical Manuals, Field Manuals, SOPs). The CBI lessons will then be storyboarded. (See Example Storyboard Format on page 24) An initial review of the storyboard will be made by another educational specialist to ensure that learning strategies are maximized. The educational specialists will then code the course using IconAuthor™ authoring software.

F. Hardware and Software Configuration

Software needs are one IconAuthor™ per authoring station, run-time systems for student stations, and one Windows™, Microsoft Access™, and Training Management System (TMS) per authoring and student station.

In compliance with Restricted Rights, as required by the Federal Acquisition Regulation (FAR) and included in the BDM proposal, BDM will provide the required licenses to run the software that is supplied with the hardware. The government may transfer the computer for which the software is licensed to any other facility. As is the case with all commercial software, it may not be reproduced or transferred, other than allowed in the license. The Program courseware, however, and the modifications made to the BDM TMS, will be the property of the government and will come with Unlimited Rights to the Government.

DRAFT
STORYBOARD FORMAT

Lesson/Topic:

Module Title:

Frame: This is a logical grouping of information that will be contained in approximately one frame, the exact arrangement of contents will be determined as the module is authored. This could be one or more "frames."

Text: Written information that will appear on the screen.

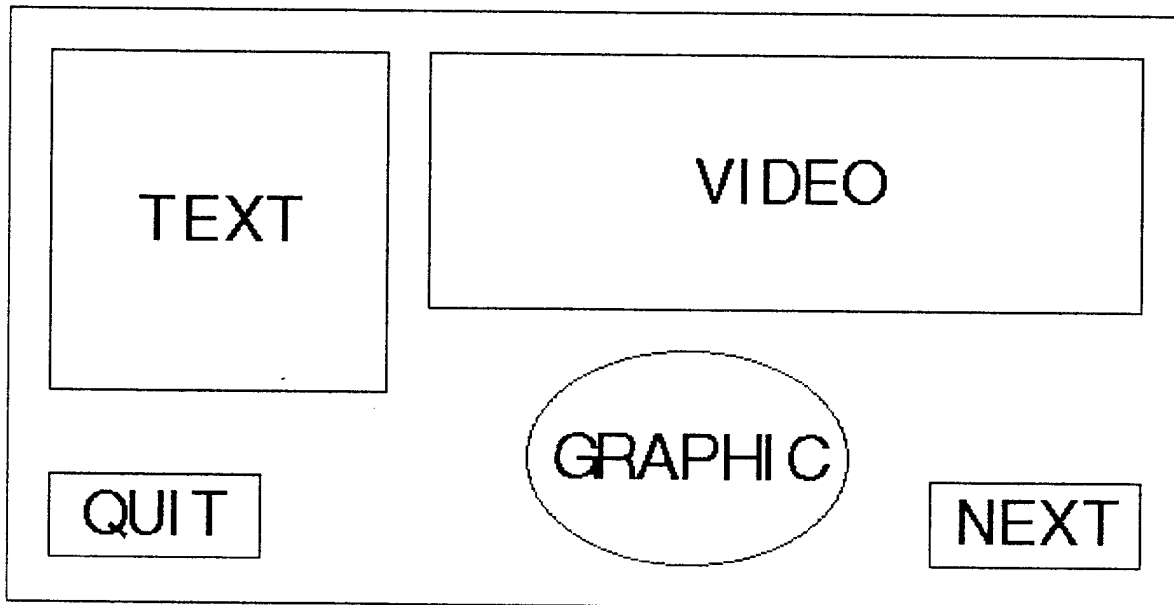
Audio: Description of sound and written script.

Video: Description of ideas and references to existing video or needed footage.

Graphics: Description of ideas and reference to existing video or needed footage.

Screen Layout: This is a reference to a sketch of where all of the elements (Video, Text, Graphics, Options) will appear on the screen. Many frames may reference the same screen layout.

Special Instructions: Descriptions, as needed, of what will be occurring such as sequence or flow.



The following paragraphs describe the hardware configuration for the Authoring Workstations, Training Management Stations and Student Workstations.

Authoring Workstation and Training Management Station

- 66 MHz 486DX2 Microprocessor
- 16 MB RAM 256 K Cache
- 7 16-bit ISA slots, 2 slots on VL-Bus
- 3.5" floppy drive
- 5.25" floppy drive
- CD-ROM drive
- 1.2 GB SCSI w/controller
- Local bus SVGA video card with 2 MB video memory,
DVI compatible with internal feature connector
- Sound Blaster audio card
- Intel Action Media II DVI board with capture feature
- 15" color monitor, NEC 4FGE multisync
- Tower case with 6 front-panel-accessible drive bays
- 2 serial and 1 parallel printer ports
- 124 key keyboard
- MS-DOS 6.0
- Windows 3.1
- MS-Mouse and software
- MS-DOS Word for Windows
- 2 GB internal SCSI DAT tape drive
- 600 VA uninterruptible power supply with error detection
and network utility software
- 9600 BPI network modem
- Internal ethernet adapter card, 32 bit for 10BaseT, thin
coax connector (NIC)
- 2 GB 8 mm Tapes
- High fidelity stereo headphones

Portable Student Workstation (Luggable 30 lbs)

- 66 MHz 486DX2 Microprocessor
- 12 MB RAM 256 K Cache
- 2 16-bit ISA slots
- 3.5" floppy drive
- Sony CDU31A CD-ROM drive
- 250 MB IDE hard drive
- Local bus SVGA video card with 2 MB video memory,
DVI compatible with internal feature connector
- Sound Blaster audio card w/two external speakers

Intel Action Media II DVI board without capture feature
Built-in 8.5" SVGA color display
2 serial and 1 parallel printer ports
101 key detachable keyboard
MS-DOS 6.0
Windows 3.1
MS-Mouse and software
200 watt power supply
Internal 14.4 Kbps fax modems, V32.bis
9600 BPI network modem
High fidelity stereo headphones

III: METHODOLOGY

Task 1: Prepare a Comprehensive Contract Performance Plan.

When approved, this document will satisfy this task. This plan describes the development methodology and milestones for the five tasks involved in this effort. After review by the Contracting Officer Representative (COR) at ARI -- Presidio of Monterey (POM), the plan will be finalized and resubmitted 30 days after original submission.

Task 2: Develop the Training Management System Methodology.

A training management system (TMS) will track student progress and gather and display data about student use of and interaction with the courseware, student interactions with instructors, and group exercise performance. This TMS is a customized version of an off-the-shelf system which is currently in use in industry training programs. The TMS is designed so that student training data will be periodically uploaded from individual training platforms and incorporated into the training database. The TMS used for FSB training will be identical to that used for the battle staff training being developed in Fort Benning, and it's design and development was a cooperative effort between the courseware development team involved in that project and the Camp Dodge team. See Appendix B for an overview of the TMS.

In summary, the TMS is an enabling environment for CBI development and delivery. The communication system adopted for home study option is "Windows For Work Groups"™ with net modems." The TMS goals are:

- to allow students to proceed at their own pace and refresh themselves as necessary,
- to assist the staff in the management of their curriculum and materials,
- to automate the administration of training,
- to provide on-line testing,
- to record student/lesson performance data in an accessible form, and
- to acquire data about the lessons themselves

Task 3: Develop a Computer-based Delivery System with Self-Contained Training and Interactive Conferencing Capability.

Three platform configurations will be used in FSB Training. These platforms are for the TMS, authoring, and student training. The platforms were developed from off-the-shelf hardware and will use both off-the-shelf and custom-developed software. The platform configurations were designed by BDM, in concert with the Camp Dodge and Fort Benning teams.

Task 3.1: System Design. The hardware and off-the-shelf software required for the three platforms will be supplied at a later date. Student and authoring platforms will be capable of stand-alone delivery of the courseware to be developed in this effort and of accessing a

communication system using Windows for Work Groups™ with modems for interaction with instructors, participation in asynchronous training exercises, and uploading of training data.

Task 3.2: System Development. Current schedules indicate that authoring hardware and software will be furnished approximately November 30, 1993. Two authoring systems and one student system will be furnished to the Camp Dodge team by BDM. Small pieces of custom code will be developed to handle the transfer, storage, and retrieval of training data. These custom components will be integrated into the TMS and courseware.

Task 3.3: System Testing. Testing of the training system will be conducted by the four processes described below:

- **Initial testing of system.** The Camp Dodge team will be equipped with two authoring stations and at least one student station. Before authoring begins, the student and authoring stations will be tested for adequacy and for compatibility. In particular, we will test the accurate transfer of screen colors between authoring and student workstations. The appearance of screen colors is a function of the workstation's video card, and to a lesser extent, of the monitor. We will also test the readability of various text sizes, fonts and attributes on both authoring and student workstations. The aim of this testing is to ensure that the screens produced by the author/programmer on the authoring system translate accurately and effectively to the student workstations. The result of the study will be standards for color use, text sizes and attributes, and size of graphics. The Camp Dodge team will exchange information with the Fort Benning team to ensure that all aspects are considered.
- **In-process testing.** Throughout the authoring process, authors will test the function and usability of courseware under development, both on the authoring workstation and on the student workstation. Any problems with display appearance or timing or with authoring should be uncovered and corrected during this process. The ARPA Support Team will ensure that the on-line training is technically accurate and works as they originally envisioned it.
- **Formal Quality Assurance (QA).** As each segment of courseware is completed, it will be submitted to a thorough QA process. A schedule for QA will be set up and the Project Manager will assign a specific individual to QA each product. This individual will be one that did not have a major duty in producing the original. During this testing, standard checklists will be used to ensure that the courseware is free of functional and display errors (e.g., misspelled words, mislabeled equipment, transposed digits) and that it is an accurate implementation of the storyboards. Technical accuracy of the courseware will also be checked by the ARPA Support Team during this testing process.
- **Interface testing.** Once several segments of courseware have been developed and submitted to the formal QA process, those segments will be tested for the useability of the user interface. The Iowa National Guard has agreed to furnish

personnel for testing who are typical of the intended target audience. These surrogate students will "take" the courseware just as the actual students will, but they will be accompanied by a courseware developer who will note all questions and problems that the students have during the testing sessions. This testing will also include use of the communications system for posting and retrieving messages and for uploading data. There will be several iterations of this testing process, as various systems (e.g., courseware, data uploading system, messaging system) are completed. Testing requirements and schedules will be coordinated with the Iowa National Guard by the Project Manager.

Task 4: Development and Validation of CBI Materials.

The most effective and efficient way to produce good courseware is to assemble a team of experts, each of whom has expertise in a discipline required in the development process. The number of team members varies from project to project. The team which has been assembled for the FSB training consists of:

<u>Location</u>	<u>Position</u>	<u>Person</u>	<u>Expertise</u>
Monterey	Program Manager	Mr. Thomas Lewman (BDM)	Program Management
	Technical Director	Dr. Ward Keesling (PRC)	Technical Direction
	Training Developer	Mr. William Mullen (BDM)	Sr. Military Analysis
Reston		Dr. Frank O'Mara (PRC)	Education Psychology
Albuquerque	Vice President	Dr. William Doherty (BDM)	Measurement Educational Specialist
		Dr. Nancy Atwood (BDM)	Learning Strategies
	System Modifications	Dr. Sherry Frese (BDM)	Systems
Cp. Dodge, Ia	Site Manager	Dr. William Deterline (PRC)	Management CBI Development
	Admin. Assistant	** CPT Sherrie Rogers (PRC)	Admin Support Military SME
	Educational Specialist	Ms. LuAnn Brown (PRC)	CBI Development
		Mr. Paul Caligiuri (PRC)	Educational Psychology/CBI Development Technology
		Ms. Joyce Merschman (PRC)	Course/Graphics

	Mr. Christopher Roberts (PRC)	Technology/CBI
	Dr. Diana Lee	Educational Psychology & Testing
Subject Matter Experts	"LTC David Raes (ARPA)	Command/ Staff
	"CPT Dennis Ratashak (ARPA)	Medical
	"CPT Kevin Miller (ARPA)	Maintenance
	"MSG Roger McCullough (NG)	Supply
	"CPT Richard Lang (NG)	Staff

* ARNG, retired

** Active member of Army National Guard

In February a part-time computer specialist will be hired to complete the internal Alpha tests on the CBI lessons as they are completed. Other team members may be required at various phases in the development process, and will be drawn from the experts available to PRC. Additional members may include:

- graphic artist(s)
- programmers
- writer(s)
- editor(s)
- media specialist(s)
- programmer/software engineer(s)
- technical systems expert(s)
- data entry expert(s)
- technical documentation specialist(s)

The team will employ a systematic approach (as depicted in Figure 3) throughout the development process.

Analysis. The ARPA Support Team will do extensive analysis to ensure the battle focus of tasks. They will coordinate for the on-going development of doctrine at the Army Schools, the CCF development at POM & Reston, Virginia, analysis of rotations at the CTCs by CSS units, through analysis of the CTC Archive at POM, and Center for Army Lessons Learned (CALL) at Fort Leavenworth.

The educational specialists will continually analyze the latest learning techniques and CBI applications.

Evaluation of these functions is on-going internally at the Camp Dodge office. At least quarterly these aspects will be evaluated by the project manager, technical manager, and the Contracting Officer Representative at POM.

Course Design. The joint ARPA/Contract team at Camp Dodge will have frequent design reviews by all of the staff to ensure the most effective design is achieved. Story boards are then produced.

Evaluation of course design will occur internally at the Camp Dodge office by the ARPA Support Team and the educational specialists. This function will be evaluated by the POM management staff at least quarterly. Corrective and improved design will occur as opportunities are identified with the spirit of continuous improvement.

Course Development begins after analysis and initial design storyboards are produced. Authoring brings all aspects of the design together -- CBI and associated aids.

Evaluation of this activity is more formal. Here checklisting of internal mechanisms are accomplished and corrections made. Members of the target audience, soldiers of the Iowa National Guard, will evaluate the product with educational specialists/ARPA Support Team members at their side to note ease of operation and learning. Products will be furnished to POM for their evaluation as soon as available. Validation will be complete when all agencies have evaluated the courseware and corrections have been made.

Implementation is not part of this project.

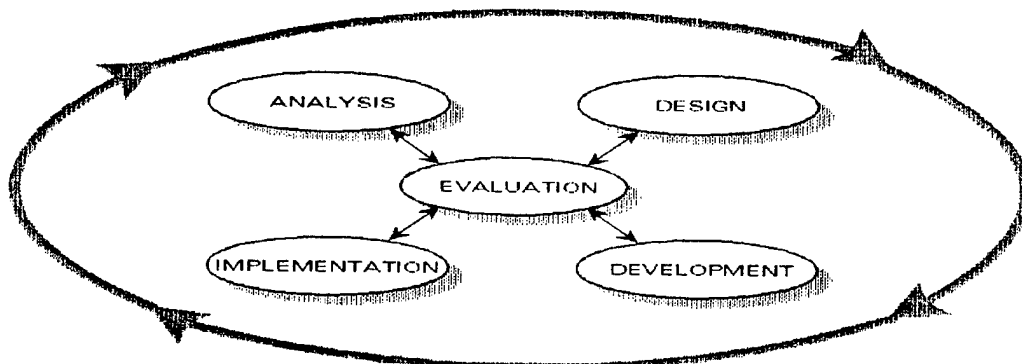


FIGURE 3: Systematic Approach to Training

Task 4.1: Development of Templates for Courses. The standards and templates for courseware in this delivery order have been designed in a coordinated development between the BDM-Ft. Benning Team, PRC-Camp Dodge, IA Team, BDM-Albuquerque, and BDM-PRC-ARI at POM Team and will be used to maintain commonality between the courses throughout the project. They are shown in Appendix C. Areas of standardization are shown on page C-2.

These standards will define the student interface that will be developed for use in all FSB training courses. This interface will be based on:

- The characteristics of the student audience,

- The strengths and weaknesses of IconAuthor (the authoring software chosen for developing the training programs),
- The learning strategies and activities to be used in the courses, and
- The top level design of the training programs.

The key consideration in designing the interface will be efficiency of use for the students. Screens will be uncluttered, options will be clearly defined, instructions will be simple and easy to follow, and students will always know where they are (and where they can go) in the program. Since these interface standards are comparable to the ones used by the Fort Benning project in developing Battle Staff training, there will be a standardization of look, feel and function between the courses. This will facilitate the adaptation of the Fort Benning Battle Staff training for use in FSB staff training.

Task 4.2: Identification of Curriculum.

FSB Staff Training. As previously discussed, the FSB Staff Courses will use as much of the Battle Staff Courses developed by the Fort Benning Team as possible. The first step was for the ARPA Support Team to determine the structural differences in the Battle Staff, the FSB and the Support Battalion staffs. The results of this analysis are shown in Table 1. It was determined that the courses for the Executive Officer and Battalion S1, will require moderate modification. The FSB S2/S3, Spt Bn S2, and Spt Bn S3 courses will require moderate modification. The FSB Support Operations Officers (SPO), and Brigade Material Management Officer (BMMO), courses will require major development by the Camp Dodge team. All material for these courses will be developed from doctrine from the Army schools, CTC Lessons Learned -- from the CTC Archive at POM and CALL at Fort Leavenworth.

Company Lane Training. The selection process for prototype lanes in each company is shown in paragraph II C 2 and Table 2 and the detailed analysis is shown in Appendix E. Individual and Leader Training CBI lessons will be provided for critical tasks that are hard to train in the armory. Critical tasks that are integral parts of the lane that are routinely trained hands-on in the armory will be referenced only for continuity and when realism in the lane is needed (e.g., when driving an ambulance).

The central focus of this training will be the collective lane. A "walk" level CBI lane will be developed for the Medical Company and a Common Defend Company Sector lane. Upon satisfactory completion of this lane, the team/section will be able to effectively enter a fully resourced hands-on lane at the "run" level at a training site.

Design Strategies. The design strategies will be determined by a joint effort of the ARPA Support Team and the Educational Specialists. Jointly they will determine the learning strategies as well as course content. The strategies and content will then be combined to create storyboards. This material will be evaluated at each step. (See paragraph III, Task 3).

Task 4.3: Courseware Development. Once the lesson objectives, strategies, media and learning activities have been determined, the courseware development team will swing into full development mode. We will develop a variety of tools and procedures which will help us ensure that the outputs of each development step are complete, accurate, and error-free before those outputs are used in the next step. These tools will be customized for use with the FSB training courses.

- As discussed above, we will use the storyboard and authoring/programming templates already developed for all FSB courses.
- A graphics/media database will be used to track the generation, revision and use of all graphics, audio and video used in each FSB course. This database helps us with the configuration management of graphics and multimedia components -- for example, by ensuring that an obsolete graphic is replaced with a revised one in all instances where it is used -- and prevents the inefficiency of generating new components which are duplicates of those used in other courses.
- Editing/proofreading checklists will be used at each stage of the development effort to ensure that all storyboards and on-line materials are checked for grammatical accuracy, stylistic consistency, smooth flow of information, appropriate reading level, and adherence to courseware standards for FSB courses.
- Checklists will be developed for use by ARPA Support Team when they review the storyboards and on-line materials to ensure that they are technically accurate and complete.
- Jointly the Camp Dodge Team will develop detailed procedures for checking the function of on-line courseware, the conformance of that courseware to the courseware standards, and the accuracy of the courseware, as judged by its agreement with the approved storyboards. These procedures will be customized to reflect the standards adopted for FSB courseware, and any special requirements entailed by the design strategies used in the courseware.

Task 4.4: Validation of prototype training courses True validation of any training course consists of two processes.

- Ensuring that students master the learning objectives defined for the course
- Ensuring that mastery of the course's objectives translates into improved performance "on-the-job"

Only the first validation process is within the scope of this effort.

To validate the mastery of learning objectives, a validation study will be conducted using Iowa National Guard soldiers that are currently in comparable units. A preliminary schedule for conducting this study is shown in the milestone chart in Section IV of this document. The final

schedule will be developed through coordination with the COR, the ARPA/ARNG program, and the Iowa National Guard to ensure the commitment of soldiers that will be required to meet the schedule milestones. The Site Manager and Senior ARPA Officer at Camp Dodge are responsible for development of this schedule, and will submit it for approval by the Contracting Officer Representative not later than February 18, 1994.

Task 5: Development of Automated Diagnostic, Performance Measurement and Assessment Component.

Task 5.1: Performance Measurement for Individuals. Performance measurements for individuals will consist of two components:

- diagnostic evaluation and prescriptive results
- mastery testing

Diagnostic evaluation will be of four types:

Pretests. In the prescribed training mode, a pretest will be administered at the start of each CBI lesson before the student is allowed to enter the lesson. The results of the pretest will be recorded and uploaded to the TMS. The scores will be used to advise the student on appropriate training options for that lesson. For example, a student who achieves a "passing" score on a pretest will be advised to progress to the next lesson. He or she will also be given the option of taking the lesson (or any portion of the lesson) and of moving to the next lesson at any time, without taking the mastery test. Alternately, the results of the pretest could indicate that the student needs to take and master certain specified portions of the lesson before progressing. A student who "fails" the pretest will be advised to take all segments of the lesson and successfully complete the mastery test for that lesson before progressing.

Quizzes. Quizzes are questions which appear every 5-10 frames within each lesson, and are used solely for the purpose of helping the student gauge his or her understanding of the instructional material. The results of quizzes may be recorded for use in course analyses, but are not maintained as a part of a student's training record. Students are given immediate feedback (correct or incorrect) and/or remediation when they respond to the quiz questions.

Exams. Students will take exams at the end of each training topic as a formal measure of their understanding of the subject matter. Exam scores will be recorded (and uploaded later) and will be used to determine whether students are ready to move on to the next topic. In rare cases, students will not be allowed to progress to subsequent topics until they have successfully completed previous topics (as determined by minimum acceptable performance on the topic exams). Such structured or "lockstep" pathways will be discouraged, and will be used only when the ARPA Support Team and contract Educational Specialists agree that the structure is necessary for successful mastery of objectives. (A browse or refresher mode will be developed for experienced personnel so that they will not be constrained by these structured lessons.) Only students who have passed all exams will be advised to take the corresponding mastery test.

Students will be advised to take mastery tests upon the successful completion of a lesson (as defined by passing scores on all exams in the lesson). Items on mastery tests will be developed by ARPA Support Team and the contract Educational Specialists working together, and will be based on the learning objectives for the lesson. The number of questions on each test, and the number of correct responses that must be given to attain mastery will be decided by the courseware development team, in consultation with ARI and the National Guard. Students who do not attain mastery in a lesson will be advised to review their weak areas in that lesson before progressing to the next lesson. As with lesson topics, students will sometimes be prevented from progressing to subsequent lessons until they have shown mastery of previous lessons. This structured approach will be used only when it is deemed necessary to mastery of objectives. (The browse or refresher mode which will be developed for experienced personnel would allow them to avoid the structured pathways.)

After Action Reviews (AAR). The "walk" level Lane Training will culminate in an AAR. Styled after the AARs conducted after a CTC exercise the Company Lanes will have a scored AAR which summarizes the performance of the team/individual in the lane. This AAR will reinforce good performance, provide cues for maintaining performance, and provide for further training in tasks which were performed poorly or unsatisfactorily. The National Guard drills monthly; it would be a good idea to repeat the CBI lane as the team gets closer to taking the hands-on lane. Team turnover will also be handled very well by putting new soldiers through the individual training and then repeating the CBI lane for the team.

Task 5.2: Performance Measurement for Battle Staff and Asynchronous Exercises. Individual training for FSB staff members will be evaluated in the same manner as for individuals in the forward support companies. This process is described above in the discussion of Task 5.1.

Asynchronous training, for both FSB battle staff and the forward support companies will require non-computerized performance measurement processes. Specifically, instructors or "mentors" will be used to supervise the asynchronous training and to evaluate the performance of participants. The evaluation process will be based on the After Action Review (AAR) techniques which are used for evaluation of team exercises at the combat training centers, and mentors will be trained in AAR techniques and their application to asynchronous training exercises. In general, these techniques will include restating the training objectives, discussing how the events which occurred in the exercise related to the objectives, diagnosing performance during the exercise, and prescribing individual training to correct weaknesses and sustain strengths.

AARs from the CTCs will be studied to determine the feedback to be attributed to each MOS or battle staff function involved in the group exercises. Participation of each individual in the exercise will be recorded and feedback will be posted on the bulletin board concerning each MOS or battle staff function and the appropriateness, timeliness, and synchronization of their participation. This feedback will allow participants to evaluate their own performance and will help the mentor(s) diagnose specific tasks which need extra training attention.

For FSB battalion staff training, feedback will specifically concern critical staff information processing functions which support the synchronization of battlefield operating systems. The feedback that will be supplied to FSB battle staff participants will be coordinated with the feedback generated for the parallel effort to develop training for maneuver battle staffs, so that a common set of dimensions is measured.

IV. SCHEDULE MANAGEMENT PLAN

The tentative schedule for tasks and deliverables under this contract is shown in Figure 4.

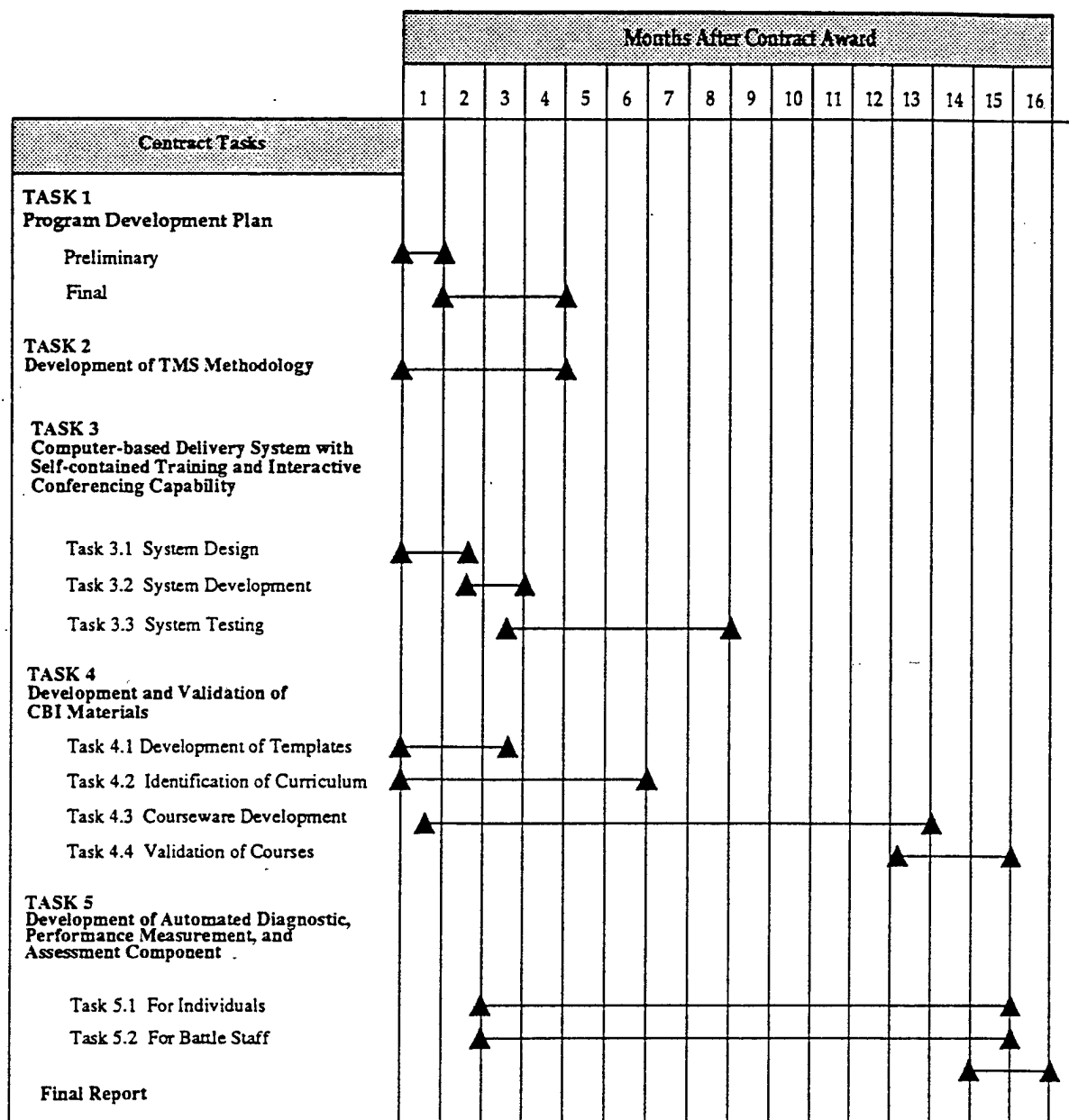


Figure 4 - Schedule Management Plan

Task 4.3: FSB Battle Staff and Company Training - Office Management Plan.

CBI Lesson Completion Plan below indicates when the CBI Lessons portion will be completed to include their respective Alpha (internal) test. These milestones by lesson are subject to change as some topics may be completed quicker than others. The staff lessons that use the Fort Benning products as their foundation are dependent on when the Camp Dodge office receives the course outlines, storyboards, and completed CBI from the Fort Benning effort. This office may reorder lesson sequence to gain efficiencies.

<u>Lesson Description</u>	<u>Estimated Hours of CBI</u>	<u>Lesson Description</u>	<u>Estimated Hours of CBI</u>
<u>February 21, 1994</u>		<u>May 31, 1994</u>	
B-1 "Inspect/Troubleshoot Tracked Vehicles"	1.25 hr	B-5 "Repair TOW2 Missile Guidance System"	2 hr
B-2 "Repair Diesel Power Pack"	1.25 hr	C-5 "Treating Respiratory Dysfunction"	1 hr
C-1 "Control Bleeding"	1 hr	Staff:	
C-2 "Plan for Evacuation Support"	1 hr	F(-) "Support Operations Officer (SPO) (-)"	2 hr
D-1 "Terrain Analysis -- OCOKA"	1 hr	J "Spt Bn S3"	2 hr
D-2 "Plan Sector Defense"	.5 hr	K "FSB/Spt Bn -- S1"	2 hr
Staff:		<u>July 11, 1994</u>	
E(-) "Common Core -- CSS"	2 hr	A-1 "Supervise Receipt and Storage of POL"	2.25 hr
F(-) "Support Operations Officer (SPO) (-)"	2hr	A-2 "Inspect POL Products"	1.5 hr
<u>March 21, 1994</u>		B-6 "Organize and Deploy Maint Support Teams (MST)"	2 hr
B-3 "Troubleshoot/Repair Radio Sets"	1.5 hr	B-7 "Supervise/Perform Battle Damage"	
D-3 "Prepare Support Plans 1 hr and Repair".75 hr		C-6 "General Medical Treatment"	1.5 hr
D-4 "Defend Against Level 1,2,3 Attack"	.5 hr	C-0 "Ground Ambulance Evacuation -- Lane"	2 hr
D-5 "Perform Withdrawl Under Fire"	.5 hr	Staff:	
Staff:		F(-) "Support Operations Officer (SPO) (-)"	2 hr
E(-)"Common Core -- CSS"	2 hr	L "FSB/Spt Bn S4"	2 hr
F(-) "Support Operations Officer (SPO) (-)"	2 hr	<u>August 8, 1994</u>	
G "FSB S2/S3"	2 hr	A-3 "Direct POL Environment and Security Control"	1 hr
<u>May 2, 1993</u>		A-4 "Tanker Operations and Safety"	1 hr
B-4 "Repair Traversing Systems"	.75 hr	Staff:	
C-3 "Casualty Management"	2 hr	I "Brigade Material Management Officer (BMMO)(-)"	#4 hr
C-4 "Triage/Survey Patients"	1.5 hr	M "FSB/Spt Bn XO"	5 hr
D-6 "Conduct Hasty Displacement"	.5 hr		
D-0 "Defend Company Sector -- Lane"	1 hr		
Staff:			
F(-) "Support Operations Officer (SPO) (-)"	2 hr		
H "Spt Bn -- S2"	2 hr		

#Note: 8 hours of this course will be developed directly from the SPO Course F.

Course Completion Milestones. These milestones indicate total course completions and the percentage of their respective deliverable (e.g. FSB Staff or Company Training).

June 28, 1994 Course Completion

<u>Course Description</u>		<u>% Total Company Training</u>	<u>% Total FSB Staff Training</u>
Course D	"Company Defend"	16.7%	
E	"Common Core -- CSS"		11.2%
G	"FSB S2/S3"		7.4%
H	"Spt Bn S2"		7.4%
J	"Spt Bn S3"		7.1%

July 28, 1994 Course Completion

B	"Company 'B' - Maintenance"	31.0%	
C	"Company 'C' - Medical"	33.4%	
F	"Support Operations, Officer SPO"		24.1%
K	"FSB/Spt Bn S1"		6.4%
L	"FSB/Spt Bn S4"		6.4%

August 12, 1994 Course Completion

A	"Company 'A' - Supply"	18.9%	
I	"Brigade Material Management Officer (BMMO)"		24.1%
M	"FSB/Spt Bn XO"		5.9%

Note: FSB Staff Training Program completed August 12, 1994

APPENDIX A

**PROGRAM DEVELOPMENT PLAN:
BATTLE STAFF TRAINING SYSTEM DEVELOPMENT
FOR U.S. ARMY NATIONAL GUARD UNITS**

EXTRACT

II TECHNICAL OVERVIEW

C. Technical Approach

At home or armory distributed CBI is the foundation for this training system. Staff officers will receive their computer based instructional materials either pre-loaded on a PC, through computer disks, through CD ROM or downloaded from a central repository/server. The final, selected media will be determined by the hardware choice and cost effectiveness of distribution and maintenance, after considering the options discussed below.

Staff will have access to a trainer (be it the commander, executive officer, or member of the RTD; however, research has shown a competent mentor to be the preferred approach to maximize battle staff competency) through the use of an electronic bulletin board type system. The trainer (or, the preferred approach, a mentor: a competent ex-battalion or brigade commander) will assist in answering specific questions, will give references to doctrinal publications, and will eventually act as a controller in collective training exercises. Staff officers in training may also use this bulletin board as an asynchronous counterpart to student out-of-class get-togethers usually found on resident school campuses. In this manner, ARNG officers can really help one another with problems and discuss each course of instruction. Such a battle staff bulletin board can actually prepare individuals for the synchronized team activity essential for successful collective exercises and ultimately actual performance at the CTC or war.

At the collective level of instruction, the bulletin board may provide the means to host (at a crawl level of training) traditional orders drills which have been found effective in the determinants study. This asynchronous group activity will receive much instructor feedback early in a unit's battle staff training, with progressively more shaping toward real time exercises, with all battle staff present at the armory, perhaps during a MUTA-4. Certification in these exercises will certainly provide the credentials necessary for the even more realistic exercises also being prepared for later delivery, via the SIMUTA research project under design and development at ARI Ft. Knox.

All functional area courses (S1, S2, et al.) will be composed of subjects (Staff Planning Process, Intelligence Preparation of the Battlefield, Preparation of the Reconnaissance and Security Plan) which will be composed of lessons of one to two hours duration, on average, for completion, which will be composed of topics of 10-15 minutes duration. A Training Management System (TMS) will allow the commander, executive officer or designated trainer (mentor) to monitor the progress of individual staff officers as they complete courses, subjects and lessons, ensuring that mastery of skills is achieved before moving to advanced lessons or

the collective exercises. The TMS can also assist in the evaluation of overall training effectiveness.

CBI development will be structured following standards developed specifically for this effort (see task 3.5, page 17 and Appendix C).

1. Instructional Concept The multimedia CBI may include graphics, still photography, computer-generated diagrams, audio and full motion video with audio, when appropriate. Video will be used sparingly to minimize storage costs and disk requirements at playback and download. CBI will be used where it is a clearly superior method of instructional delivery. The instruction will consist of three levels: mastery of basic skills; application of skills to solve problems; and application of skills as part of collective exercises (Figure A-1).

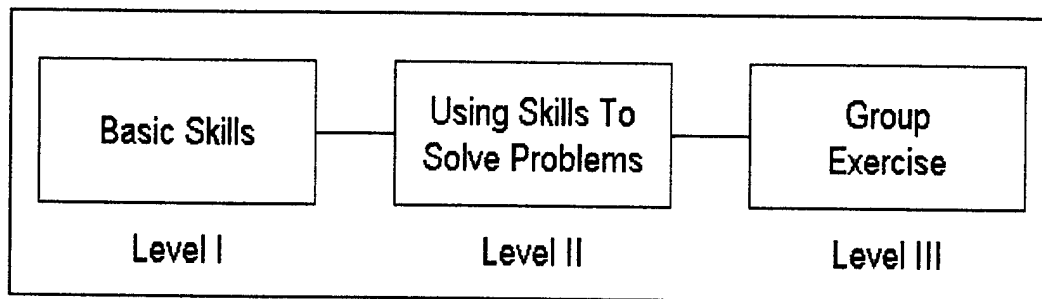
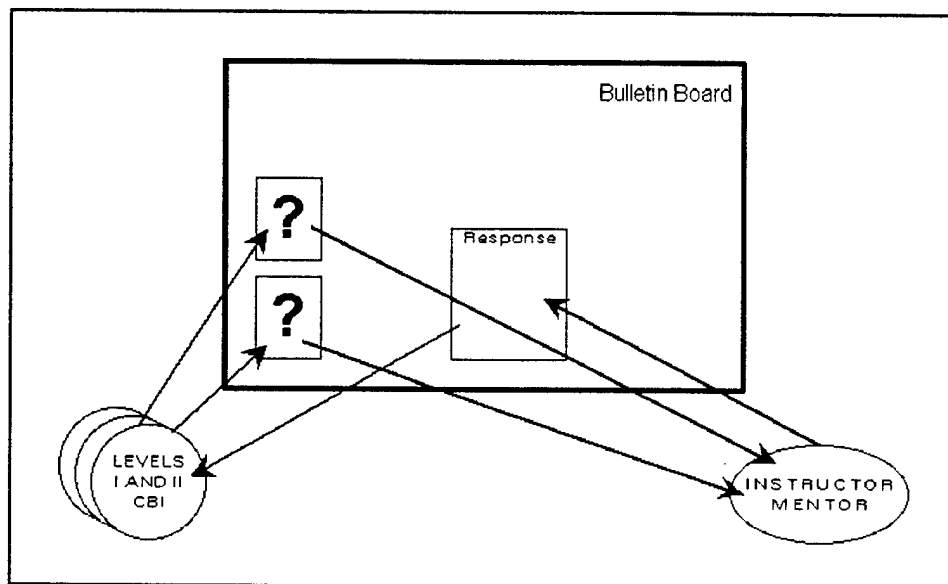


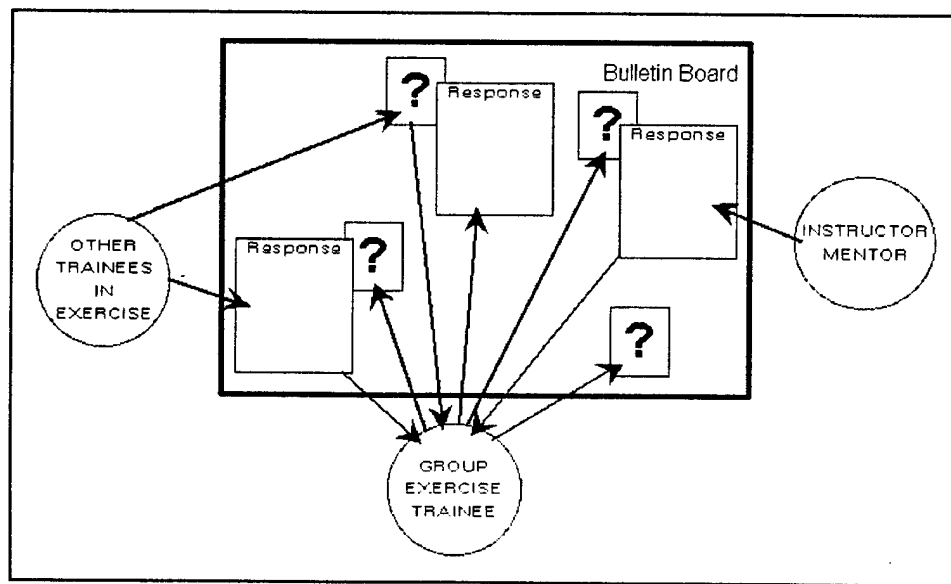
Figure A-1: Progression of Courseware

Instruction for mastery of basic skills, Level I, the most simple type of instruction, consist of an assessment, insertion into the instruction at the required lesson or topic (based on the TMS assessment), instruction in procedures and requirements, practice of the skills, and measurement by question and answer techniques. A level of mastery, to be determined during standards development (task 3.5), will be required before the staff officer can go to more advanced material. Feedback is an integral part of the instruction and testing cycle. When necessary, the courseware and/or the trainer (mentor) will diagnose the problem and prescribe manuals or other training materials to ensure training mastery. Application of basic skills to problem solving, Levels II and III, will require more staff officer and trainer (mentor) interaction to accommodate other than school solutions, an finally to present possible solutions (e.g., "a way", Brown 1992) or courses of action to solve the problem. The staff officer will be taught to think about the problem, to apply the learning acquired in Level I, and to apply the decision making and staff planning process. One method to teach the officer to think is the application of Quick Decision Exercises, QDE. QDE will be a time limited exercise where, on a no-notice basis, the officer will be presented with a problem. Solution to the

problem will require quick application of previously mastered tasks. This will lead to a resolution and/or input to the battle staff for decision and implementation (Olmstead, 1992). Also, the bulletin board will allow staff officers to pose specific questions to the instructor (mentor), and will allow for alternative solutions not anticipated by the instruction (See Figures 2a and 2b).



**Figure A-2a: Instructor/Staff Officer Interactions
at Levels I and II**



**Figure A-2b: Instructor/Staff Officer Interactions
at Level III**

Group, interactive collective training will also involve the bulletin board. CBI will present excerpts from the brigade operations order, commander's planning guidance, commander's intent, as required to complement the instructional scenario, but the outside analysis and expertise (staff estimates, courses of action) will be provided by the battle staff members and the trainer (mentor). Since interactive training cannot be guaranteed in an at-home system, staff officers will post answers to inquiries or required, doctrinal staff input for the planning process through the bulletin board. This interaction among battle staff members can take place at this third level of instruction, in an adaptation of the staff planning process and After Action Review (AAR). Such interaction can take place both asynchronously, or "live" during a scheduled drill. A live AAR would take place upon completion of the group/collective exercises. Discussions of the procedures followed and solution (e.g., "your way", Brown 1992) offered should be performed in a face-to-face battle staff meeting, as a required part of training.

APPENDIX B

TRAINING MANAGEMENT SYSTEM FOR THE ARMY NATIONAL GUARD

Extract

TRAINING MANAGEMENT SYSTEM FOR THE ARMY NATIONAL GUARD

Extract

1. The TMS Concept

The Training Management System (TMS) that is being developed for the Army National Guard programs is based upon the TMS product developed by BDM and marketed commercially. This document describes the TMS as it will be delivered to the ARNG for the Ft. Benning and Camp Dodge projects; not the TMS as it is normally delivered commercially.

The TMS is an enabling environment for multi-media computer based instruction (CBI) development and delivery. The goals of the TMS are:

- To allow students to proceed at their own pace and to refresh themselves as necessary,
- To assist the staff in the management of their curriculum and materials,
- To automate the administration of training,
- To provide on-line testing,
- To record student/lesson performance data in an accessible form, and
- To acquire data about the lessons themselves.

The TMS uses commercial off-the-shelf (COTS) software integrated into a system that allows trainers and administrators to make good use of the specific functionality of the packages. The Microsoft Windows™ environment then provides a familiar look and feel across the packages.

This document describes the TMS in some detail (*these chapters are not included in this extract*). Chapter 2 provides an overview of the hardware and COTS S/W used in the system. Chapter 3 describes the operation of the system from an external viewpoint. Chapters 4 through 7 provide details on the workings of the major component. There are also two appendices that provide definitions of terms used in this document.

2. TMS Hardware and Software

The hardware architecture for this system is illustrated in figure B-1. The TMS computers are all 486 PCs, some attached through a LAN, communicating via Windows for Workgroups™ (WFW), and others connected via modem.

Within the Armory

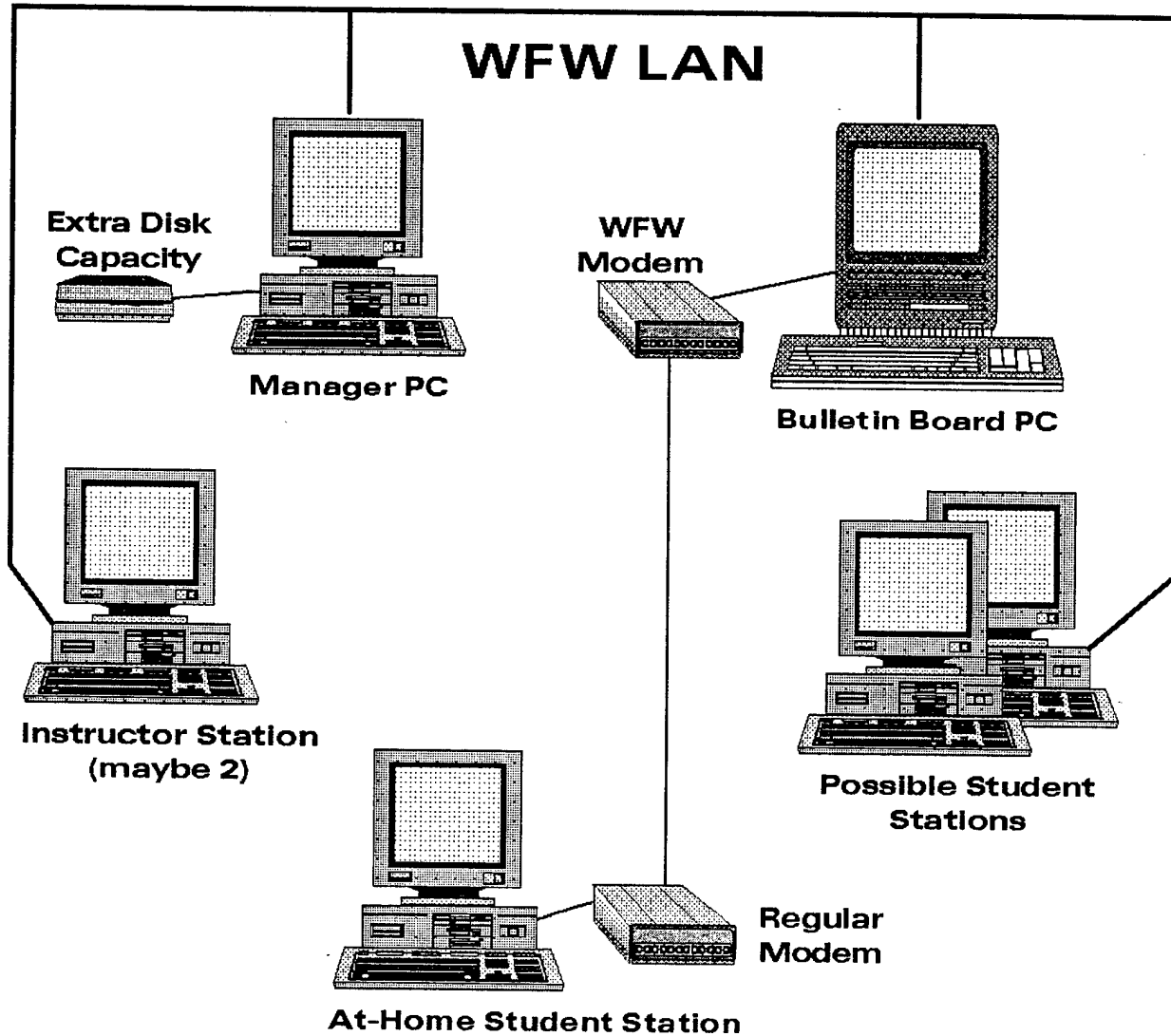


Figure B-1: TMS Hardware Architecture

The lessons¹ are stored on magnetic or optical media serviced through the TMS "Manager" computer. The Instructor and Student Stations are 486 PCs also running WFW. The Instructor and Student Stations are equipped with Digital Video Interactive (DVI) as well as Soundblaster™ hardware and software for full motion video, high quality stills, and audio². The system uses the IconAuthor™ applications software package for lesson development and display.

Figure B-2 provides brief descriptions of the TMS functional areas. More detailed descriptions are provided later in this document.

Functional Area	Description
Training Information System (TIS)	This is the database interface on the TMS manager. It maintains data on lessons, subjects, courses, student histories, schedules, etc. for administrators and instructors.
Instructor Station	Some of the Instructor's functions are performed through the TIS. The Instructor S/W is resident software on the Instructor Station that allows the Instructor access to the database, access to "Integrated Network Conferencing" (INC) for purposes of "mentoring", and access to data on the status of Student Stations on the network.
Student Stations	This software allows the student to log in and then manages the student's access to lessons. It ensures that results files are sent to the database (TIS). This S/W also allows students access to the INC for posing questions, posting requests for data, and receipt of responses.
Storage Manager	This software resides on the Manager PC. It organizes and tracks the materials that make up the various CBI lessons. It uses a commercial configuration management package to allow for efficient storage of material when only a portion of the material is changed.
Integrated Network Conferencing	This is S/W which allows users to access the system from remote PCs for the purpose of posting results, receiving new schedules, sending questions and requests for data, and receiving responses.

Figure B-2 TMS Functional Areas

¹ For the purpose of this discussion, a lesson is a self-contained piece of IconAuthor™ courseware. It will probably include manu subroutines and modules, as well as numerous multi-media files.

² The Instructor Stations are thus able to run the Student Station S/W and the courseware if need be. While DVI supports audio, the current Windows audio/video kernal (AVK) doesn't support simultaneous play of DVI still and DVI audio file, hence the use of a Soundblaster card. The DVI will allow play of full motion video with audio, since they exist in the same AV file.

All of the functional areas are interrelated and communicate with each other via messages, files, and in some cases, via the database. Sections 3 through 7 provide further details on these interactions from both the user and the software viewpoint.

Figure B-3 lists the COTS S/W used by the system.

COTS S/W	Where Used
Windows for Workgroups	All PCs in TMS
PVCS (Configuration Management S/W)	Manager PC - Storage Manager
Runtime version of MS Access	Manager PC (Storage Manager and TIS), Student Station and Instructor Station
Runtime IconAuthor	Student Station

Figure B-3 Commercial Off-the-Shelf Software Used by the TMS

APPENDIX C

STANDARDS FOR THE DEVELOPMENT OF COMPUTER BASED INSTRUCTION

STANDARDS FOR THE DEVELOPMENT OF COMPUTER BASED INSTRUCTION

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STANDARDS FOR THE DEVELOPMENT OF COMPUTER BASED INSTRUCTION

BDM, in collaboration with PRC, has developed a process both for setting standards and completed two iterations of meetings to develop standards for the Computer Based Instruction (CBI) to be used in both the Battle Staff Training and the Forward Support Battalion training for the National Guard. It is expected that in both these cases CBI will be used in conjunction with other instructional media (hand-on, paper-based, etc.).

Standards will continue to be refined, through an iterative process, by the BDM/PRC team culminating in the delivery of the prototype S2 course of instruction (Task 4, 6 December 1993).

The revised CBI Delivery Standards are in Table 1.

Descriptions and details of the components of each standard are contained below. More detailed information is included in the enclosures.

A. INSTRUCTION

1. Objectives

The enabling knowledge for entrance into the CBI include a basic literacy with computers and completion of the Officers Basic Course (OBC) for the respective branch officers.

a. Prior to beginning a specific staff officer functional course, all members of the battlestaff will complete the following lessons: Fundamentals of AirLand Battle, Decision Making, the Staff Estimate, and an overview of an organizational competence model (Olmstead).

b. The three levels of learning for a lesson will include Fundamental Skills (individual definitions and components of the staff functional area), Individual Problem Solving (give a problem, apply knowledge, produce a behavior), and Collective Training (issue essential

portions of a brigade operations order or warning order, apply the organizational competency model, apply basic skills, produce individual staff output and the battalion warning order or operations order).

- c. The form of training objectives will be Task - Condition - Standard.

INSTRUCTION
Objectives
Role of Scenario and METT-T Factors
Course Structure
Course Mapping
Strategies
Types of Interaction
Role of Mentor
Motivation
Principles for Media Use
ASSESSMENT
Diagnostics and Prescriptions
Testing
Feedback on Test Performance
Remediation
LOOK AND FEEL
Colors
Fonts
Button Placement
Borders
Screen Layouts(s)
FUNCTION
Navigation
Help
Glossaries and Accessories
MANAGEMENT
Data to be collected
Data Storage Format
Control over progression
Support System
Reports
Guides (for Instructor, Student)

Table C-1: CBI Delivery Standards (REVISED 1)

d. The organizational competency model will follow Olmstead's model, while we will "green up" the explanation to ensure it is received to enhance the instruction.

2. Role of Scenario and METT-T Factors

a. Additional coordination and discussion are required to determine if one (or more) common scenarios will drive the basic skills and problem solving stages of instruction (clearly, common offensive and defensive scenarios will drive the collective stage). Either a coordinated common scenario will drive stages I and II, or scenarios, tailored for the training objective, will be adapted for stage I and II, when required.

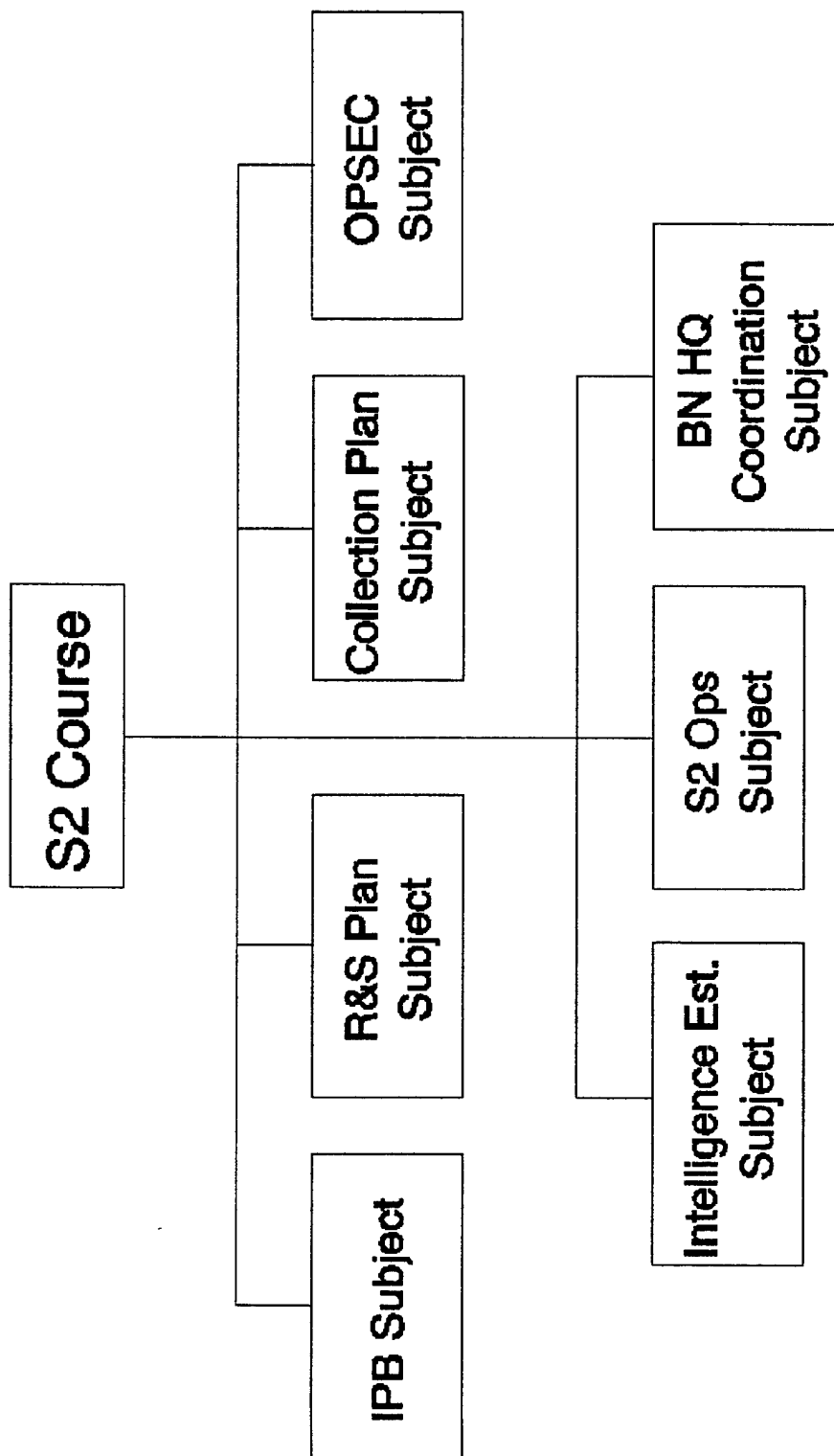
b. The factors of Enemy, Troops, and Terrain will be stabilized for training in all three phases. However, the factor of mission will be varied for offense and defense while time will be the key factor that will be varied to create the ability to perform under decreasing factors of time.

3. Course Structure and Mapping See Examples page C-3a and C-3b

The highest level of structure will be the Course (S1, S2, S3, ... SIGO). Courses will be (estimated) of 10-50 hours duration. (NOTE: The time estimates for each course will be refined beyond the rough estimates provided). The next (lower) level of structure will be the Subject. A Subject is a logical grouping of Lessons. (See figure 1) The Lesson, a piece of Icon Author courseware and associated multimedia files, will be of 1-2 hours duration. Within the Lesson there will be topics. The topic will be 10-15 minutes duration with 3-9 topics in the Lesson.

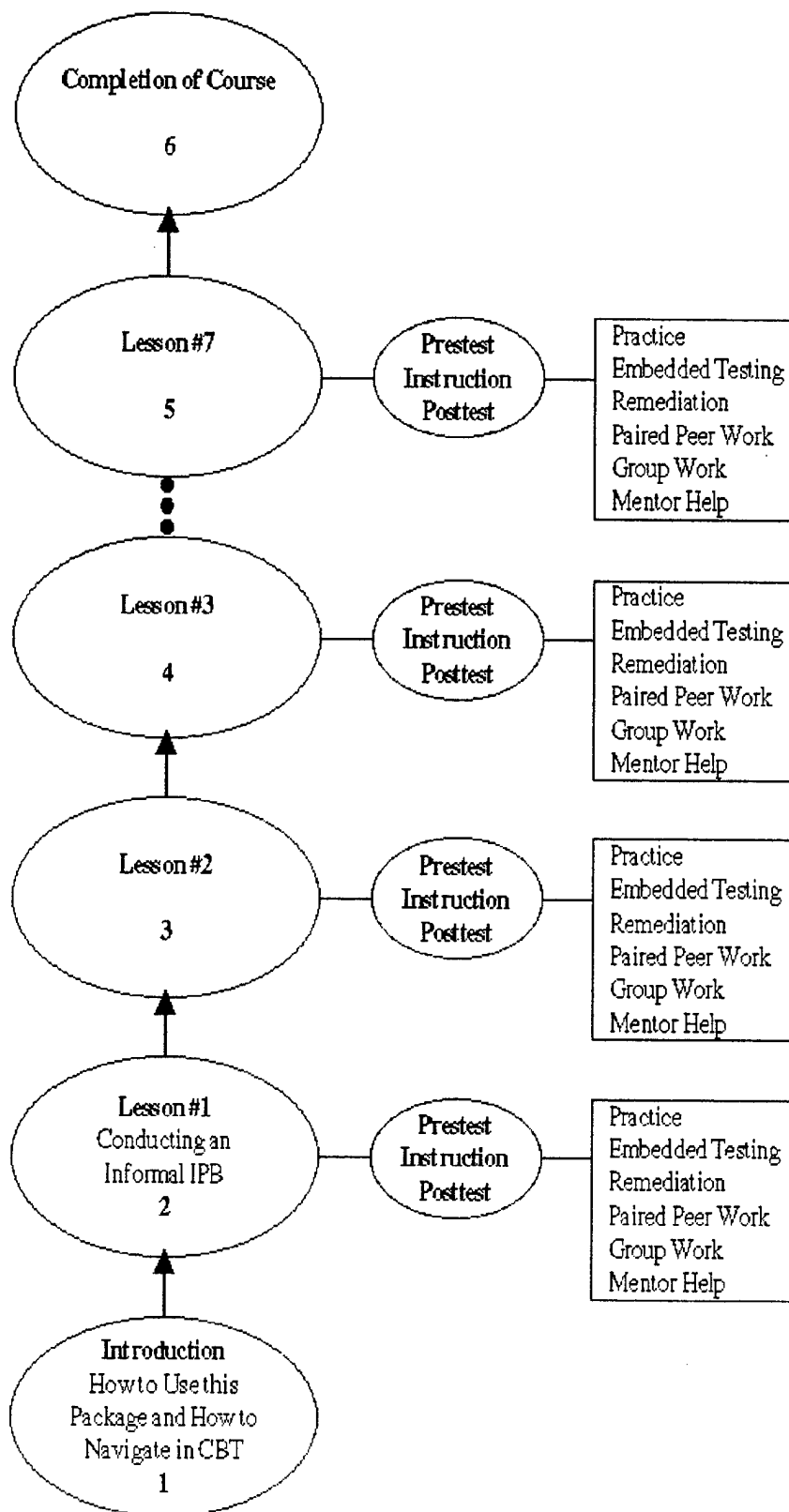
4. Strategies See page C-3c

The specific strategy applied to train a specific training objective will be selected by the development team SME following training tailored to the teams' needs. The strategies to be training and applied in the course development process are: tutorial, drill and practice, guided discover, problem solving, simulation, games, peer tutorial, and cooperative learning. Practice will be incorporated to the maximum extent possible to attain the training objective.



Course Map

Start at ellipse 1 and proceed through the map to Completion of the Course. This should give the viewer a visual representation of the flow the course will take and the sequence in which it will occur.



Computer Applications

There are many options for use of computer-based instruction. One of the primary purposes for using the computer-based training model for this package is to assure that motivation remains at a high level. There should be as much interactivity as possible to help in this endeavor.

Types of Interactive Programs

Drill and Practice: Designed to aid in memorization or to practice skills; similar to flash cards.

Tutorial: Sequences of information are followed by questions to see if the learner has understood. Based upon the responses of the learner, feedback is received and the learned is branched accordingly.

Simulations: Data supplied by the user is incorporated into the program and consequences of those choices are shown. Ex. prescribing dosages of medication to a patient and seeing the results.

Tailored Information: Allows the user to select the kind of information he/she desires. Usually, these are not instructional in nature, but more informational.

Giving the learner as many choices as possible is important in that it creates a sense of learner control which enhances motivation. We need to consider branching a learner through the training based on the results of the pretest data. If the learner has already mastered some information, he/she should not be required to go through this instruction unnecessarily.

Possible ideas for computer use:

Learning games (review, practice, reinforcement): concentration, roulette, Jeopardy

"Commercial Breaks": Interjected within the program to entertain the student and help to maintain interest and motivation.

Role Models: An expert might introduce and conclude each lesson via digital video.

Advance Organizers: Organizers should be provided for the learner to help him/her see where they are going and where they have been. Provide a cognitive reference point.

Simulation: This can be done in various ways. Perhaps there could be a scene with invisible boxes that contain information a learner will need to know in order to complete a mission. This could also be combined with pausing to let the learner interact with the field manuals or other learners in the group

Training for the development team will include the best application of a strategy to a specific training objective. The SME Development Team will also be trained in behaviorally-oriented principles of instruction which are appropriate to consider in designing specific instructional strategies.

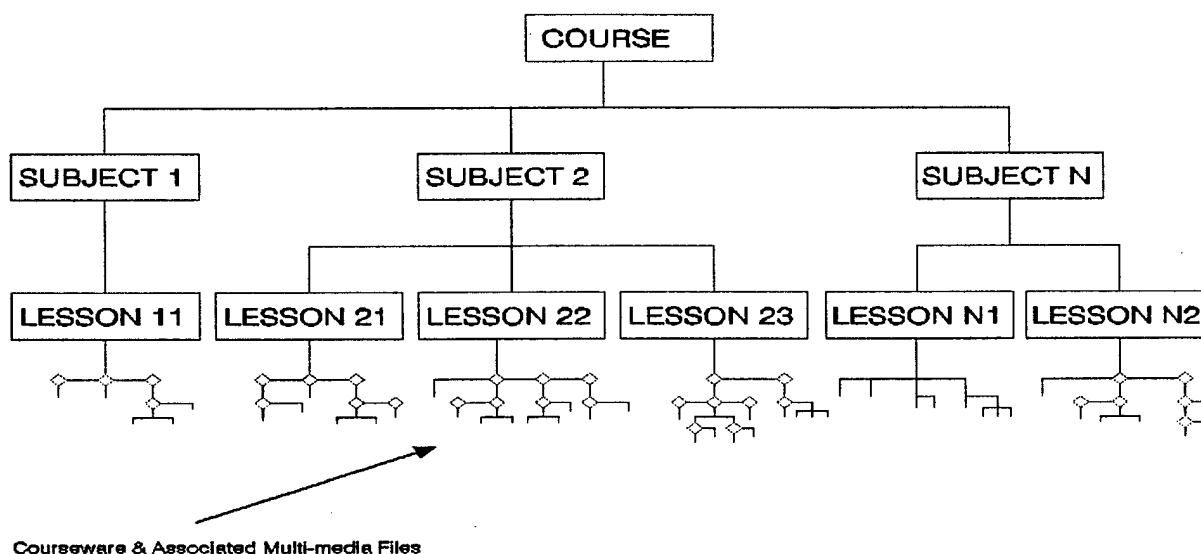


Figure C-1: General TMS Curriculum Structure

5. Types of Interaction

For each strategy selected, the SME will design the appropriate type of interaction to best achieve the training objective. Types of interaction will include recognition, recall, comprehension, application/analysis, and synthesis and evaluation. The section on feedback, diagnostics, and testing has more on this.

6. Role of the Mentor

Clearly, the optimum method to achieve a high performing staff member and battle staff is through the availability of a mentor during the process. As to whether this program can now, or in the future, acquire/afford a mentor is to be discussed and explored during the period of the contract. Regardless, an instructor or trainer is required and will be available through the bulletin board. Students, at any time, will be able to pose a question that will ultimately be posted to the bulletin board for response by the mentor, instructor, or trainer. As the battle

staff progresses through the course structure (stages I - III) there will be an increase need for the mentor, instructor, trainer.

7. Motivation

Techniques to be applied to motivate the student (and overcome commonly observed attrition effect in distance learning) by the SME/design team will include humor, fantasy, games, challenges, and competition with self and/or others. These techniques will be applied based on the learning stage, type of skill and instructional method.

8. Principles for Media Use

Use of Media will be tailored to the training objective and meet the test of effectiveness (training and cost).

a. Video will be used judiciously for key points, to gain attention, or for motivation. It can be applied for the issuing of operation/warning orders and, to a minor extent, for variety.

b. Most screens will use audio to emphasize key points and supply additional information to the learning. A male voice will be preferred in most cases. Existing audios or videos may be used as needed.

c. Text will be used on most every screen and amplified with audio, video, graphics, photo stills or animation. The goal will be to prevent the CBI from becoming a "page turner".

d. Graphics and photo stills will be used to anchor a learning objective and apply doctrinal publication (Field Manuals, ARTEPs, and Tactics, Techniques and Procedures) To ensure the officer can quickly refer to the doctrinal publication in field application.

e. Animation can be used, again judiciously for motivation or variety.

f. Level of reading will be confirmed with the TRADOC SME. Start point will be a 10th grade level of reading.

B. ASSESSMENT

1. Diagnostics and Prescription

Each lesson will begin with a diagnostic test that is identical to the final lesson examination. The student will not be given the correct answers to the pre-test; however, he will be told (and indicated in the lesson menu) the topics he did well enough on to skip over during the conduct of the lesson as well as being told which topics in the lesson he needs to complete to attain mastery. If the student desires, he will have the opportunity to complete topics on which he has attained mastery.

2. Testing

a. There will be three types of tests: quizzes, exams, and final exams. Quizzes will not be graded for record, but results and answers will be stored in the database for future analysis. Exams will cover one topic in a lesson and will be graded and recorded. Minimum score, to be set by SME, will be required for mastery and before the CBI will recommend the student move to the next topic. Final exams (Mastery Exams) will be identical to the pre-test and cover the entire lesson. Minimum score, set by the SME, will be required for mastery before the CBI will recommend the student progress to the next lesson.

b. Each lesson will have a final examination. Mastery of the material will be required before the CBI will advise the student to move to the next lesson. Students will be offered remediation before the second exam (first re-test) is given. If the student does not attain mastery on the second examination, he will be referred to the mentor, instructor, or trainer for remedial training in doctrinal publications prior to returning to the CBI. The score that will equate to mastery (70-100%) will be designed by the SME during the design process.

c. Examination format will be multiple choice or a derivative thereof in most cases, as the computer cannot grade essay type examinations. Derivatives of the multiple choice include matching, sorting, choose from a list, choose spots or locations on a map or graphic, or limited use of fill in the blank. Essay examinations (prepare the S1 estimate, prepare a warning order) will be used when necessary to measure mastery. Grading of essay examinations will be by the mentor, trainer or instructor and the grade entered into the database after completion.

3. Feedback on Test Performance

As mentioned in the section above on Testing, there are three types of tests to be used. The answers and scores on all three types will be recorded within the TMS. The following address user feedback on each type.

a. Quizzes will be either exercises or at least instructional to the user in terms of what he still needs work on. It is suggested that immediate right/wrong feedback be given on each question; with reinforcement for right answers, and inferences as to what is correct for wrong answers. In many cases it will be appropriate to re-ask the question when the answer is wrong.

b. Another potential exercise would be to ask the user to write something and then compare his response to a solution. Since these are self-graded, they will not be recorded in the database.

c. Fill-in-the-blank exercises may be used. The computer will "grade" these by comparing the user's response to a list of acceptable responses (minor variations in spelling should be included in the list).

d. Timed-exercises may also be use. This would allow the user to try to improve his time as a means of motivation.

e. Exams will be used for Go/No Go between topics within a lesson. As such they will be scored by the computer, and the user will be told his score but not which answers were right and/or wrong. Specific remediation areas will be mentioned based on specific problems identified in the Exam.

f. As with exams, Mastery Tests will be used to indicate mastery in a lesson. They will be scored by the computer, and the user will be told his score but not which answers were right and/or wrong. Based on the areas missed, the user will be shown the topic menu with thumbs up/down to indicate which topics should be re-examined before retaking the Mastery Test.

4. Remediation

If a student does not attain the minimum score set by the SME or mastery, the CBI will recommend he return to the topics he needs remediation in, and he will be referred to additional references for remediation. After the second failure to attain mastery the student will be referred to the mentor, instructor, or trainer through the TMS an the bulletin board.

C. LOOK AND FEEL

The following standards reflect what is readily available within the Windows and the IconAuthor environment. Templates will be created to make much of the navigation and function more easily used.

1. Colors

The following colors will be used.

- a. Background - Dark Blue
- b. Text - Yellow
- c. Titles - Yellow or White
- d. Emphasis - White or Red

2. Fonts

Fonts to be used are:

- a. Arial will be used for text; titles in 20 pt., regular text in 16 pt. (14 pt. is acceptable if needed).
- b. Buttons will be in the system font.

3. Button Placement

Navigational buttons will be at the bottom of the screen and will be consistent throughout all the courseware. Size and placement of buttons are discussed in the section 5 on screen layout.

4. Borders

Screens will not have borders on them.

5. Screen Layout

a. Menus will be centered and contain no more than 6 menu buttons. (Possible screen buttons on bottom). They should be 50 by 240 pixels. (Larger if needed).

b. Menu buttons will normally correspond to topics. They will also indicate the time expected for a user to complete the topic. Normally the user will progress through the topics shown in order. This can be forced by allowing access to a topic only when the previous topic is completed. Figure 2 provides a sample Main Menu.

c. To aid the user in navigating, the Main Menu will be titled with the Subject and Lesson, as in figure 2.

d. Submenus may be used either as extensions to the Main Menu (when there are > 5 Topics) or as a means of breaking up a topic into small pieces that the user can access individually. In either case, the same look/feel standards mentioned above apply. The Submenu should contain the name of the lesson and the topic, instead of the subject and lesson.

e. No more than two layers of menus should be used within a lesson, as this can become confusing to the user.

f. Other than Menus, most other material will be shown a screen as shown in Figure 3. Buttons are 50 x 160 (Options and Replay) and 50 x 120 (Next and Previous). Not all buttons will be available all the time. Those not available should be grayed.

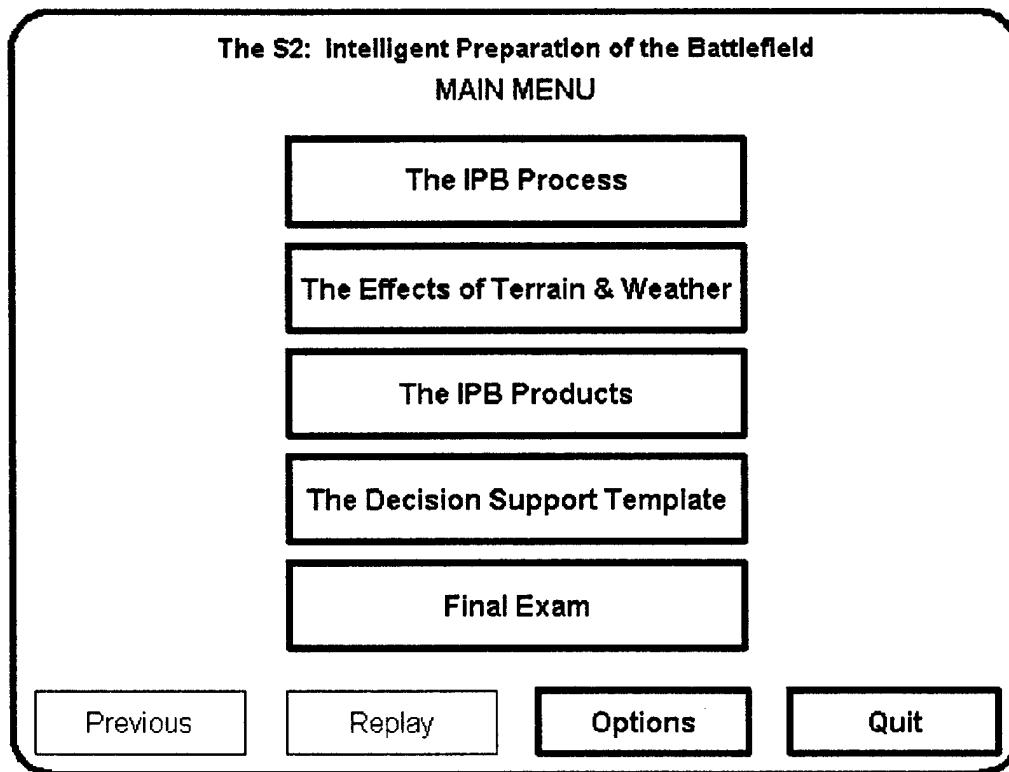


Figure C-2: A Sample Menu

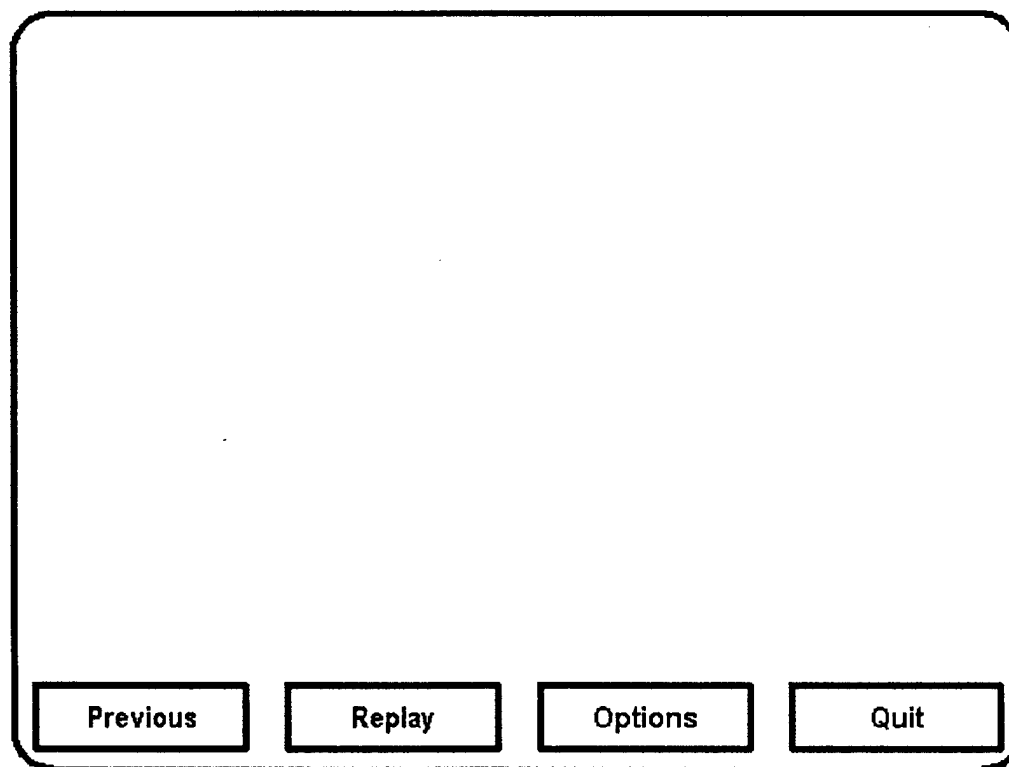


Figure C-3: Standard Screen

g. The "Next" button is used for page turning when needed. Not all screens should require the user to press "Next" to get to the following screen, but certainly any screen with a substantial amount of text or diagrams should allow the user to choose when to proceed. One the Main Menu the "Next" button will be replaced with a "Quit" button (as shown in figure 2).

h. The "Previous" button is the reverse of "Next". The result of "Previous" is not necessarily the previous screen. For example, one might show a diagram with audio, followed immediately by a text screen referring to the diagram (figure 4). The Text screen (B) contains the "Next" button, which sends the user to screen C. The "Previous" button on screen C might more naturally send the user back to the diagram (A) rather than the text.

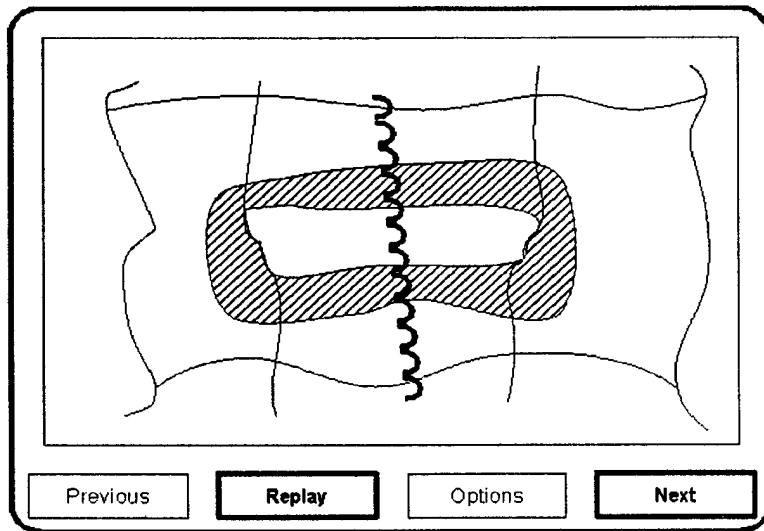
i. The "Replay" button is more immediate. It would normally be used to replay an audio or an animation. Again, "Replay" might cause the user to replay several screens.

j. The "Options" button is a catch-all. It produces a sub-menu of options. these will normally include a Menu, a Glossary, a Calculator, a Post-a-Question and a Help function. Figure 5 provides a sample of what this will look like. Again, not all of these need to be available all the time, although the help and glossary should be available most of the time¹. The Menu function returns the user to the menu on which the current topic resides. Other standards for glossaries etc. are discussed below.

k. In the case of A-E type multiple choice exams, 50 by 50 pixel buttons labeled A - E should be used. In these cases, response will be captured immediately. In other cases, such as choose from a list, matching, etc., the "Next" button may be used to register the response.

l. All videos will be presented on a VCR-like screen as shown in figure 6. The user will be able to start the video at his leisure, pause it, pick up at the pause (resume), or replay from the beginning (rewind). The "Stop" button will stop the video and go to the next frame.

¹ The Glossary and help functions will not be available during Exams or the Mastery Exam?



Screen A

Screen A is a diagram, maybe with an audio that explains it. The Next button goes to Screen B. The Replay button replays the audio.

BATTLEFIELD AREA EVALUATION

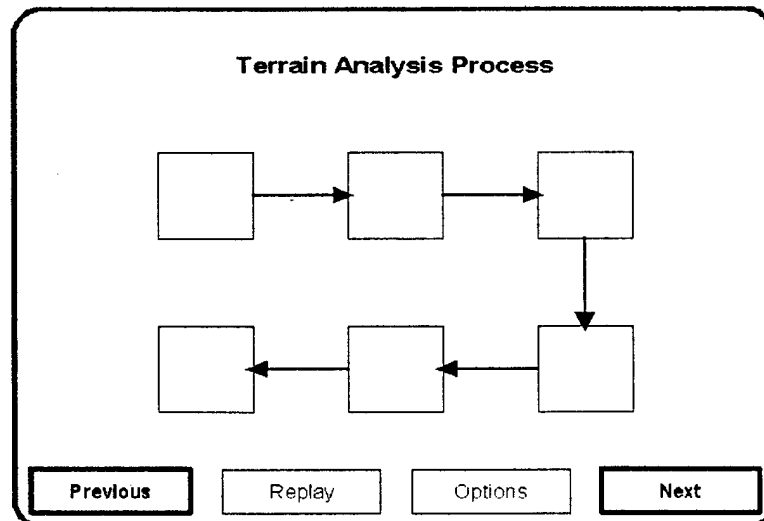
<u>COMMAND ECHELON</u>	<u>AO (HRS)</u>	<u>AI (HRS)</u>
Battalion	0-3	up to 12
Brigade	0-12	up to 24
Division	0-24	up to 72

Previous Replay Options Next

Screen B

Immediately following Screen A is Screen B. This is some text. The user is allowed to read it and then press Next.

He then goes to Screen C.



Screen C:

Screen C is something new. The previous button will back the user up, either to screen A or screen B, depending on the Author's choice.

Figure C-4: Navigation Using Next and Previous

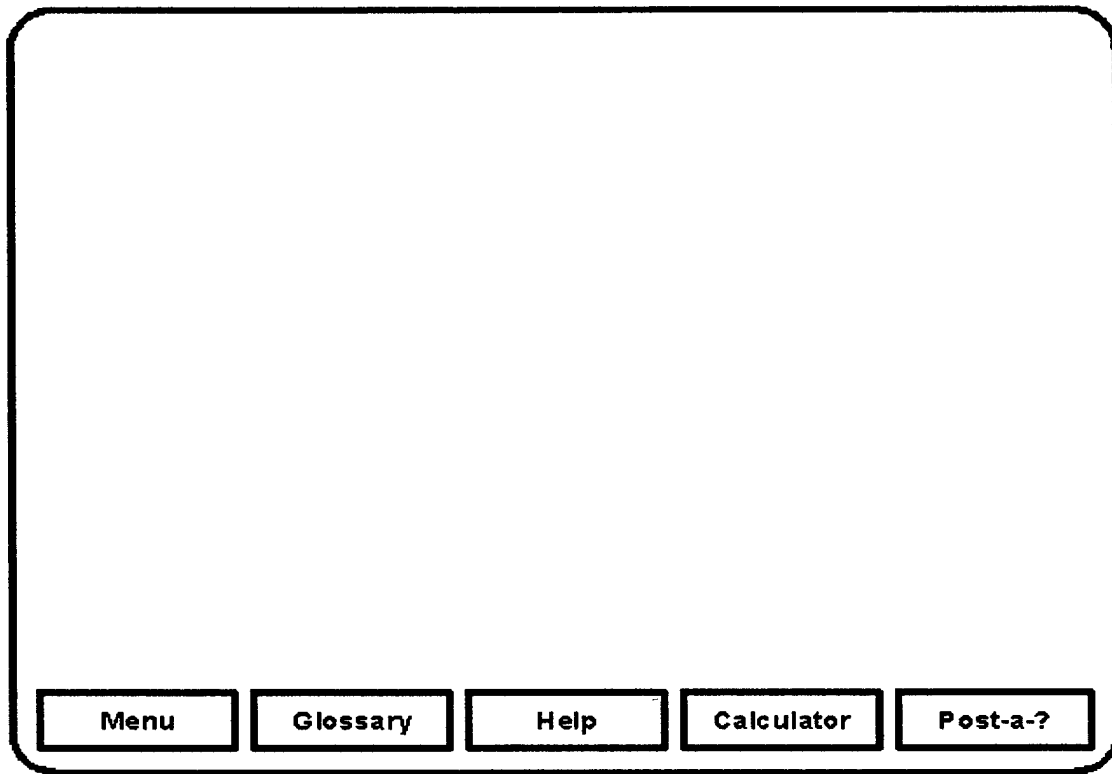


Figure C-5: Sample of the Options Menu

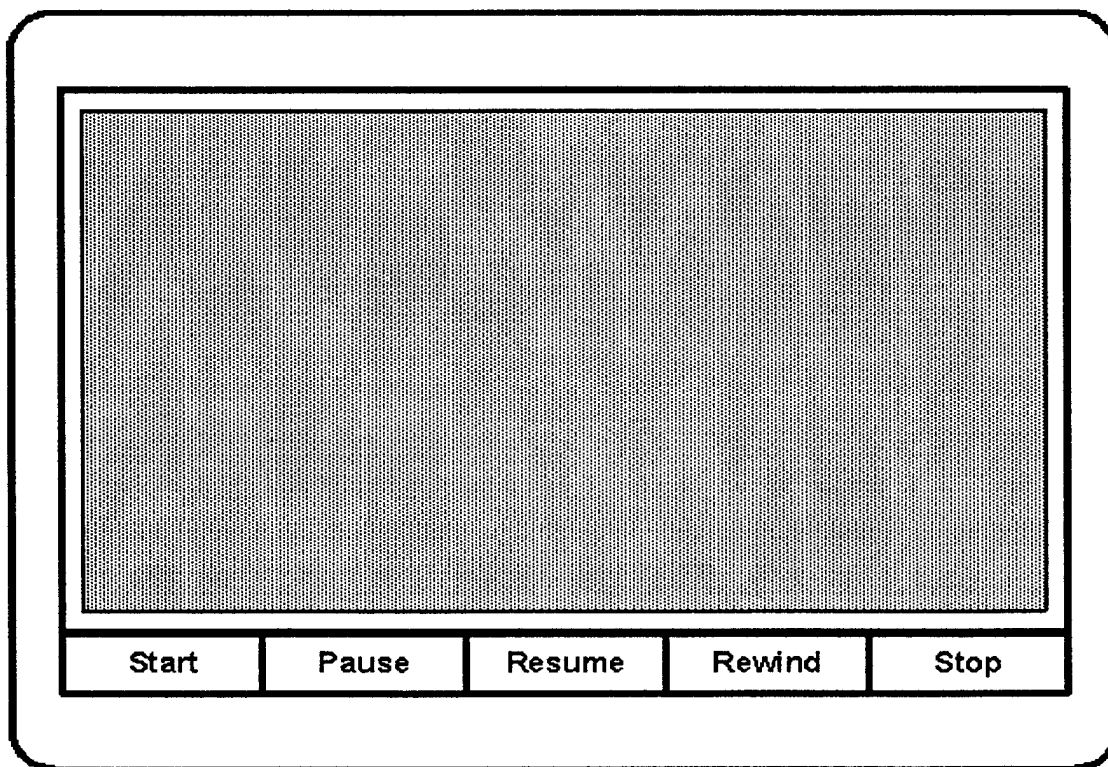


Figure C-6: VCR Screen

D. FUNCTION

1. Navigation

a. Initially, a user who failed the pre-test will get a Main Menu, as shown in figure 7, where all but the first topic is grayed-out. When the exam on the first topic is completed, the user gets a menu as shown in figure 8. The second topic is now available to the user, and the first topic is italicized because he has completed it, but he can go back to it if he wishes.

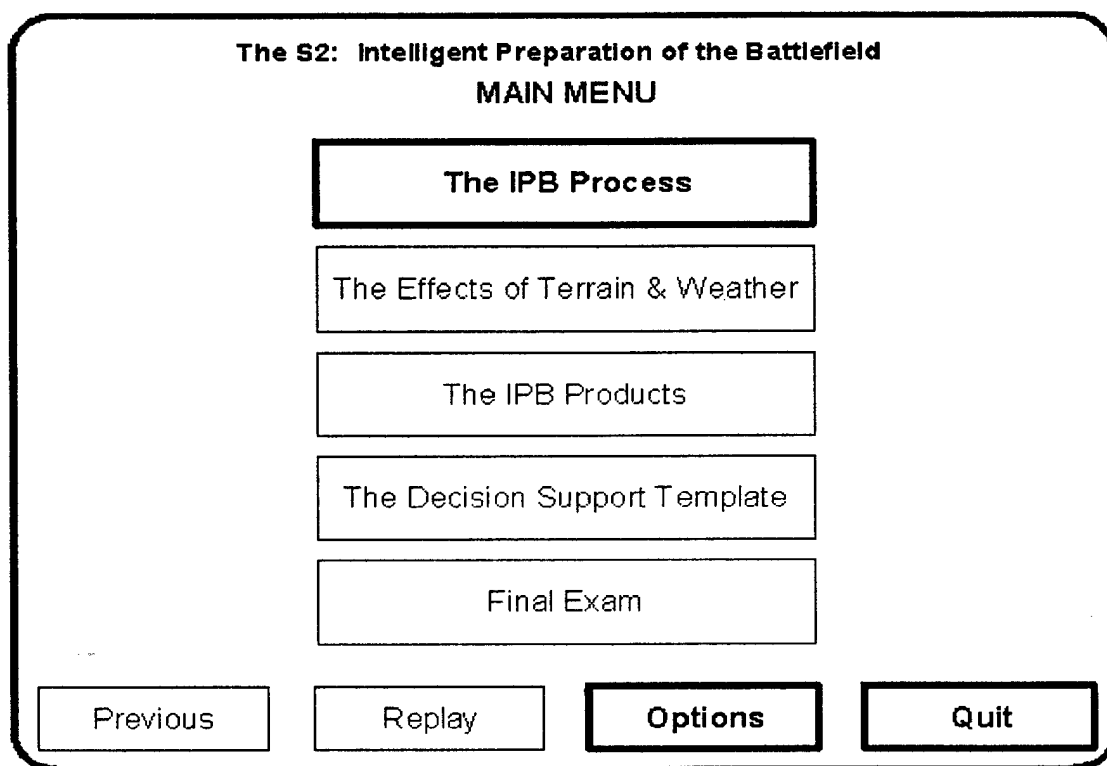


Figure C-7: Main Menu for a User Who Performed Poorly on the Pre-Test

b. If a user performs satisfactorily on some (but not all) topics in the pre-test, he is automatically credited with passing those topics. For example, someone who did well on the sections of the pre-test dealing with the IPB Process and The Decision Support Template, but poorly on the rest, would get the menu shown in figure 9 rather than figure 7 upon completion of the pre-test. He will still have to take the entire Mastery Test for lesson completion, however.

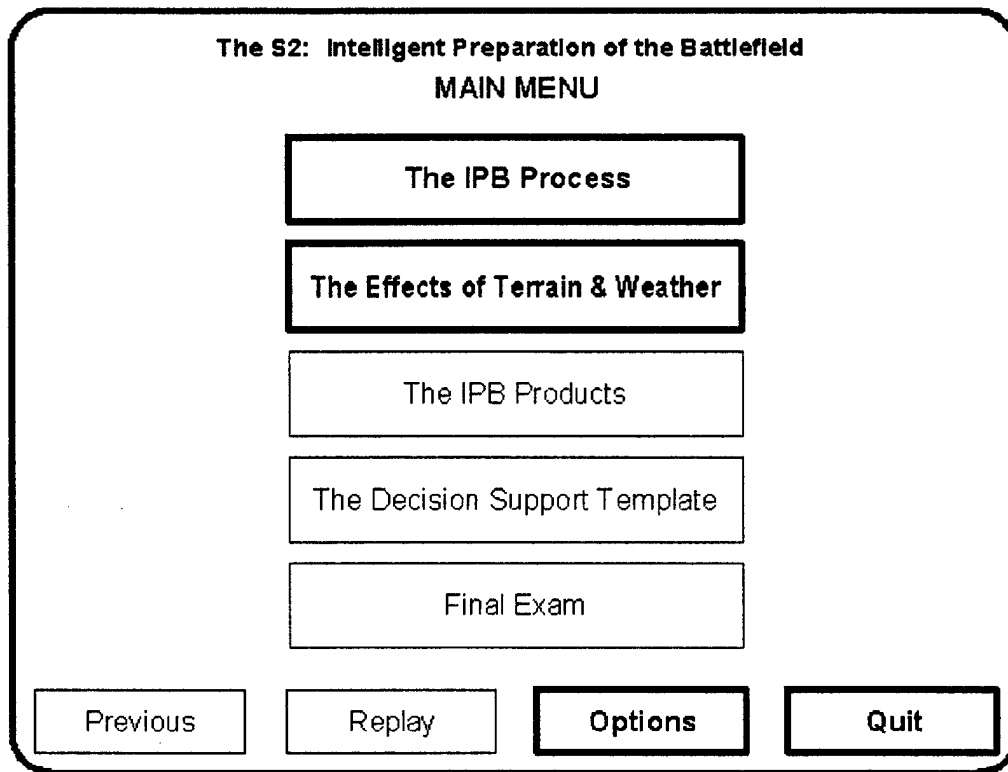


Figure C-8: Main Menu after First Topic is Completed

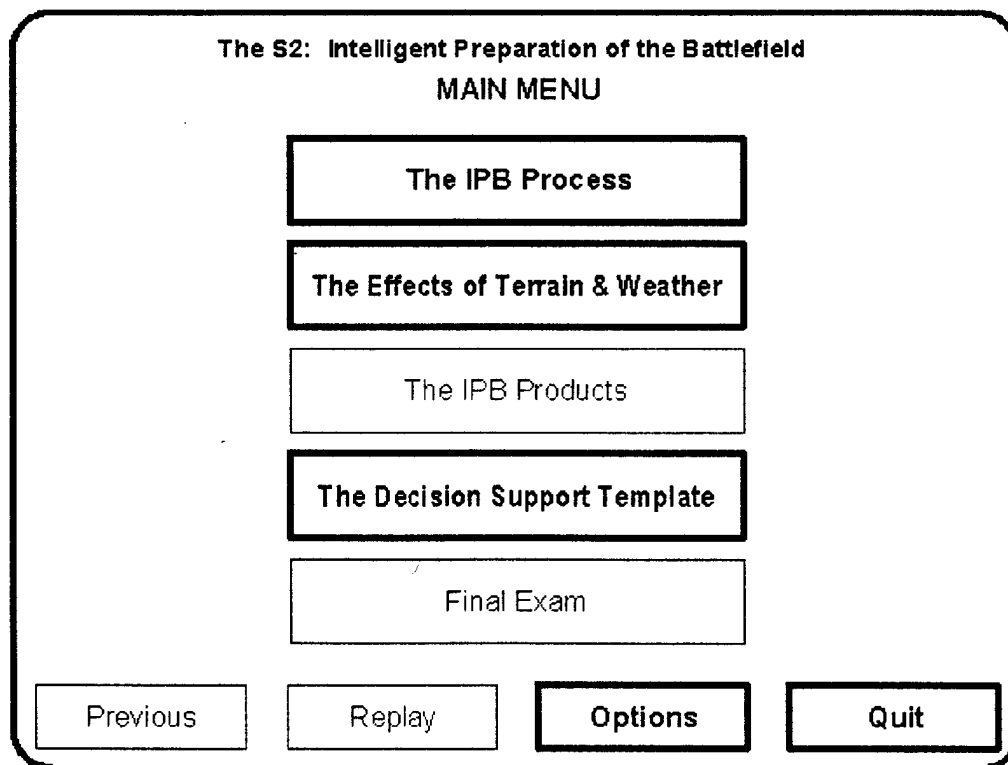


Figure C-9: Menu for Someone Who did Well on Two Topics on the Pre-Test

c. Whenever a student exits the CBI, a bookmark will be placed so he may return to the start of the topic he was working on, but did not complete, the next time he turns on the CBI.

d. Each topic will have a summary screen at the end, prior to the examination, to refresh the student and reinforce the learning objectives.

e. The user will not be allowed to take the mastery exam until all individual topics have been passed (either through the pre-test or through their individual exams). If the user passes the Mastery Exam, he has passed the lesson, and he is returned to the Main Menu with a "thumbs up" on all topics, including the Mastery Exam. If he does not pass the mastery exam, he is still returned to the Main Menu, but now with "thumbs up" only on the topics he did well on (in the Mastery Exam). Thus he will know which topics he needs to re-do before re-taking the Mastery Exam.

2. Help

a. The Help function is available through the Options. Help will not be instructions on how to use the program. Instead, it will refer the student to specific doctrinal publications (FMs, MTPs, and Tactics, Techniques and Procedures manuals) for additional research or study that might prove helpful on this topic.

b. Normally there will be a different set of Help for each topic. In some cases an author may wish to have some specific help available on a particular screen or subtopic. On the Main Menu the Help button will bring up a menu of all the topics in the lesson where a user can choose a topic and get its help.

3. Glossaries and Accessories

a. Each lesson will have a glossary designed by the SME to aid learning. The Glossary is available through the Options button.

b. Other accessories include a calculator and the Post a Question, on the Options key, as well as special student functions available outside the courseware. These are discussed below and in the section on Management.

c. A simple 4 function calculator will be available through the options key. Results will be displayed but will not be moveable to other pieces within the courseware.

d. The student will be allowed to type in a question for his mentor via a "Post a Question" function in the Options. The question, plus some information about where in the lesson he was when he asked it, will be written to a file. This file will be automatically sent to the bulletin board at the first opportunity. (See bulletin board functions under Support Systems).

E. MANAGEMENT

1. Data to be Collected from Training Sessions

a. Every exam and quiz within a lesson will have a number. This number along with the type (Quiz, Exam, Mastery Test) will be recorded in the database, as will all the user's responses to multiple choice questions. Thus, the TMS will have access to what answer (A-E) the trainee gave to question number 3 on Exam 2. If the trainee takes an exam more than once, each iteration is kept.

b. In the case of "essay" responses, these will be transmitted to the mentor and graded. The mentor will be allowed to enter the grade into the TMS database. *We will address how we will handle pass/fail on exams that include this kind of question in the TMS modifications.*

c. In addition, the start/stop date/times for each student session and the student's bookmark will be recorded in the database. Other data will also be maintained:

Names and Social Security Numbers of trainees
Current progress in courseware
Checked-out material
Curriculum

2. Data Format

a. Attached are sample screens and reports from the current TMS database. These should give a reasonable idea of the type of data available. Modifications will be made to

make it more appropriate to this application based on recommendations for specific data elements during the prototype course development process.

b. The TMS does allow for the database administrator to establish roles for users. These roles then determine to which screens, functions and reports that user has access.

3. Control over Progression

a. The TMS uses a Course/Subject/Lesson structure as shown in figure 1. The application of this structure to the National Guard training is discussed in section A.3.

b. What distinguishes a Lesson from a Subject in the user's viewpoint will be the fact that within a Lesson he will have menus and screens that allow him to navigate between topics. Whereas going from one Lesson to another will generally involve an exit from the specific courseware to the TMS student environment.

c. The standards discussed in this document (size, content, and structure) are for a Lesson.

d. Within a Course, the student progresses from Subject to Subject. within a Subject, he goes from Lesson to Lesson.

e. Until the issue of how the users will receive their courseware (lessons) is decided, control of student progression will remain an open issue. For the time being, assuming that several lessons are delivered to the user via CD ROM, the user will have control over his progression. That is, while the TMS will know that he has not yet passed a mastery exam, it will not prevent him from starting a letter lesson. It will merely suggest that he work on his earliest un-passed lesson.

f. If we should decide to go with downloads via modem or required that the user come to the armory to receive his next lesson, then it would be possible for the system to control his access to later material.

4. Support Systems

a. Outside the courseware will be the TMS student environment. The user will have several functions available here. Two are considered "Support Functions": bulletin board

access and access to the syllabus. Other functions (such as copying courseware to the hard disk, login, etc.) will be added as needed.

b. Using the bulletin board option will start the dial up and let the user choose whether to have a private or a recorded session. Recorded sessions will be available to the mentor. In either event, whenever the user logs into the bulletin board, any pending results (from exams etc.) plus any posted questions will automatically be sent up to the TMS main computer.

c. The user will also be able to find out where in the course progression he stands and what he should take next. This will be available through the TMS Student environment, not the courseware.

5. Reports

Attached are the standard TMS reports. Additions will be made to allow the following:

Grading of essay-type questions.

Recording of required communications in group exercises.

6. Guides

a. Each course will include a student guide that will include the course syllabus, course map, list of lessons, list of topics, all training objectives and a comprehensive list of references. Additionally, any maps or templates required to complete a course will be included in the guide. The student guide will refer the student to existing doctrinal publications but will not create new, or modified, doctrinal publications. One of the key goals of the courses of instruction is to enable the student to become proficient in both the knowledge in the doctrinal publications and how quickly to refer to the publications in a field environment.

b. There will be an instructor guide for all courses for use by the mentor, instructor, or trainer. The instructor guide will include all information in the student guides (see 6a), a guide on how to conduct an AAR, and the references for each topic to guide the student in remediation.

7. Delivery Mechanisms

a. It is expected that courseware will be delivered via 486 PCs equipped with Digital Video Interactive (DVI) play capability.

b. Means of delivery of courseware to the PC has not been decided. There are several reasonable routes being examined:

Download via modem: This has the advantage of letting the TMS control access to courseware on a lesson by lesson basis. The primary disadvantage is the amount of time (over long distance phone?) required to download one lesson. For example, at 9600 baud, a 60 Megabyte lesson would take 100 hours to download. This could be ameliorated by decreasing the amount of video/audio used so the courseware is smaller, or by delivering the video, audio and graphics via CD, and the courseware (scripts) via modem.

Via CD or optical: This is easiest for the users, however it does allow access to the courseware out of order. The student is essentially in control with this delivery mechanism. It might also require the use of a librarian if there are several CDs per course.

Direct Download: This would require trainees to bring their computer to the armory for a download. While this is acceptable in speed and in control, it does require a large hard disk on the student PC or else it really limits the amount of courseware the student can take home.

8. Security

a. Security at the student level was deemed unnecessary. While it isn't easy for a student to modify his answers before they go to the database, it is not impossible.

b. As mentioned earlier, the TMS allows a wide range of variation in access to data among users. We will have to work with the Guard to establish the set of roles used and who will have what role.

Administrator

Instructor

Utility

Reports

Microsoft Access - Admin Staffup Form

Employee List by Id

Employee List by Name

Course

Course List

Subjects

Lessons

Field

Field

Record: 1

Field

File Edit View Records Window Help

Field Id

Field Id

Student

Id

0123456789

Last Name

Doe

First Name

John

Middle Initial

Position

Any job

Department

Any department

Record 1

Student Identification Field

Page 1

Microsoft Access Student List

File Edit View Records Window Help

Field Id

Filter/Sort

Field Id

Student List - Id

Id	Last Name	First Name	Initial	Position	Department
0123456789	Doe	John		Any job	Any department
1111111111	Frese	Sherry	D	Developer	Training
1234567890	Estes	John	Q	Engineer	Maintenance
585420974	Estes	William	P	DBA	Information Systems
9999999999	Hafen	Andrew	G	Guru	Technical

Record 1

Student Identification Field

File

Edit

View

Records

Window

Help

Filter/Sort

Field

Course

Adm 101

Administrative Policies

Archived?

Courses

Form View

Record 1

[illegible]


555-555-5555

Course	Name	Archived
Adm 101	Administrative Policies	<input checked="" type="checkbox"/>
Course	Sample Course	<input checked="" type="checkbox"/>
Test	Test Course	<input checked="" type="checkbox"/>
		<input checked="" type="checkbox"/>

IN Record: 1

Course: Adm 101	
------------------------	--

Name: _____ Administrative Policies



 UNIVERSITY OF ILLINOIS AT CHICAGO

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The screenshot shows the 'Database Properties' dialog box in Microsoft Access, with the 'Names' tab selected. The menu bar at the top includes 'File', 'Edit', 'View', 'Records', 'Window', and 'Help'. The 'Names' tab displays a list of objects in the database. The 'Field' list is empty, and the 'Course' list contains one entry: 'Course'. The 'Table' list is also empty.

The screenshot shows the 'Database Properties' dialog box in Microsoft Access, with the 'Names' tab selected. The menu bar at the top includes 'File', 'Edit', 'View', 'Records', 'Window', and 'Help'. The 'Names' tab is active, displaying a list of fields. The 'Filter/Sort' section contains 'Filter' and 'Sort' buttons. The 'Field' section shows a list of fields, with 'Course' selected. The 'Field' list is currently empty, and the 'Field' button is disabled.

The screenshot shows the 'Database Properties' dialog box in Microsoft Access. The 'Database' tab is selected. The 'Database Name' field contains 'CS.wNames'. The 'File Name' field contains 'Course'. The 'Filter/Sort' section shows 'Filter' checked and 'Sort' unchecked. The 'Indexing' section shows 'Indexing' checked and 'Compact on Close' unchecked. The 'Advanced' section shows 'Compact on Close' checked and 'Compact on Open' unchecked.



The screenshot shows the 'Database Properties' dialog box with the 'Names' tab selected. The 'Field' list is empty, and the 'Course' field is highlighted in the 'Field' list. The 'File Edit View Records Window Help' menu bar is visible at the top.

Microsoft Access - Form Startup Form	
Administrator	Utility Reports
  	  
<div>Student Schedule Station Schedule Graph - Station Schedule Lesson Schedule Student History Lesson History Answers Assessments Assessments Summary</div>	
Record: 1	

Microsoft Access - Schedule an Employee

File Edit View Records Window Help

File Edit View Records Window Help

Filter/Sort

Field

Id

Schedule an Employee

Id: 0123456789

Name: Doe

John

Course: Sample Course

Subject: Sample Subject 1

Lesson: 1

Sample Lesson

Author: Author station

Start: 6/22/93 11:37:00 AM

End: 6/22/93 11:59:00 AM

When: Processed?

Type: S Frequency: Scheduler:

Status:

Record: 1

Form View

FileEditViewRecordsWindowHelp

FileEditViewRecordsWindowHelp

Filter/Sort

Field

Id

Student Schedule

Id

Name

D123456789

Doe

John

Start

Station

Description

Course

Courses Nam

Subject

Subject Name

Lesson

6/22/93 11:37:00 AM

Author

Author station

Course

Sample Course

Subject 1

Sample Subject 1

Lesson

Record: 1

Record: 1

Student Identification Field

NUM

File

Edit

View

Records

Window

Help

Lesson Schedule

Filter/Sort

Field

Course

Lesson Schedule

Course: Sample Course

Subject: Subject 1

Lesson: Lesson

Order: 10

Version: 1

Sample Lesson

Start	Station	Id	Last Name	First Name	M	Scheduler	End
6/21/93 10:00:00 AM	Student	585420974	Estes	William	P		6/21/93 11:00:00 AM
6/21/93 11:01:00 AM	Student	585420974	Estes	William	P		6/21/93 11:59:00 AM
6/21/93 12:30:00 PM	Student	585420974	Estes	William	P		6/21/93 1:00:00 PM
6/22/93 9:42:09 AM	Author	585420974	Estes	William	P		6/22/93 11:30:00 AM
6/22/93 11:37:00 AM	Author	0123456789	Doe	John			6/22/93 11:59:00 AM
6/22/93 12:01:00 PM	Student	1234567890	Estes	John	Q		6/22/93 1:00:00 PM
6/30/93 12:53:07 PM							

Record: 1

Record: 8

Form View

Microsoft Access Student History

File Edit View Records Window Help

Field Id

1

Student History

Id: Doe

John

Course: Adm 101

Administrative Policies

Subject: Accounting

10 Forms, Accounts, Reports

Lesson: Expense 1

0

Completing Expense Reports

6/5/93 5:00:00 PM

Completed: B

02:05

Record: 1

1

Record: 1

1

Form View

File Edit View Records Window Help

Lesson History

Course: Administrative Policies

Subject: Forms, Accounts, Reports

Lesson: Version: Completing Expense Reports

Id	Last Name	First Name	M	Date	Completed	Grade	Hours	Bookmark
0123456789	Doe	John		6/5/93 5:00:00 PM	<input checked="" type="checkbox"/>	B	02:05	9
1234567890	Estes	John		Q 5/15/93 11:00:00 AM	<input checked="" type="checkbox"/>	C	03:06	9
585420974	Estes	William		P 5/5/93 10:21:00 AM	<input type="checkbox"/>		01:01	1

Record: 1

Form View

Microsoft Access Student Exam Results

File Edit View Records Window Help

Print

Find

Filter/Sort

Field

ID

?

Student Answers

ID

0123456789

John

Doe

Course

Sample Course

Subject

1

10

Sample Subject 1

Lesson

10

1

Sample Lesson

Exam Type

Quiz

Exam Number

1

Exam Taken

6/23/93 11:00:00 AM

Question	Answer	Correct
1	A	A
2	A	B
3	A	C
Σ		

Record: 2

Record: 1

Exam View

File Edit View Records Window Help

Assessment Summary by Lesson

Course Name: 10. Subject 1 - Sample Subject 1
Lesson Name: 10. Lesson #1 - Sample Lesson

Criterion	Description	Average	Minimum	Maximum
1	Overall impression of the Lesson	1.5	1	2
2	Relevance of the Lesson	2	2	2
3	Comprehensiveness of Presentation	2.5	2	3

Record: 1

Record: 8

Form View

Microsoft Access - [Untitled Startup Form]	
Administrator	Instructor
<div>Event Types</div> <div>Stations</div> <div>Station List</div> <div>Assessment Criterion</div> <div>Frequency</div> <div>Other Events</div>	

Record: 1

File Edit View Records Window Help

File Edit View Records Window Help

Filter/Sort

Field

Criterion

Assessment Criterion Descriptions

Citation	Description
1	Overall impression of the Lesson
2	Relevance of the Lesson
3	Comprehensiveness of Presentation
4	Quality of the Lesson
5	Helpfulness to Current Work Assignment
*	

Record: 1

Form View

Answer Frequency by Exam

30-Jun-93

Course, Subject, Lesson, Version	Exam type, #	Q and A	A (s)	B (s)	C (s)	D (s)	E (s)
----------------------------------	--------------	---------	-------	-------	-------	-------	-------

Course - Sample Course

10 ... Subject 1 - Sample Subject 1

10 ... Lesson # 1 - Sample Lesson

Quiz # 1

1 OK=A

2	0	0	0	1
---	---	---	---	---

2 OK=B

1	1	0	0	0
---	---	---	---	---

3 OK=C

1	0	3	0	0
---	---	---	---	---

Lesson Usage Summary

30-Jun-93

Hours

Course Subject Lesson/Version	Average	Minimum	Maximum	StDev
Adm 101 - Administrative Policies				
10 . Accounting - Forms, Accounts, Reports				
10 . Expense #1 - Completing Expense Reports	02:04	01:01	03:06	01:02

History by Lesson

30-Jun-93

Course, Subject, Lesson/Version

Id ... Name		Date	Completed?	Grade	Hours	Bookmark	Approved?
Adm 101 - Administrative Policies							
10 .. Accounting - Forms, Accounts, Reports							
10 .. Expense #1 - Completing Expense Reports							
0123456789	... Doe, John .	6/5/93	Yes	B	02:05	9	No
1234567890	... Estes, John Q.	5/15/93	Yes	C	03:06	9	No
585420974	... Estes, William P.	5/5/93	No		01:01	1	No

History by Student Name

30-Jun-93

Student Name ... Id

Course, Subject, Lesson/Version	Date	Completed?	Grade	Hours	Bookmark	Approved
Doe, John . # 0123456789						
Adm 101 - Administrative Policies	6/5/93	Yes	B	02:05	9	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						
Estes, John Q. # 1234567890						
Adm 101 - Administrative Policies	5/15/93	Yes	C	03:06	9	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						
Estes, William P. # 585420974						
Adm 101 - Administrative Policies	5/5/93	No		01:01	1	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						

Catalog

30-Jun-93

Course - Name

Order ... Subject - Name

Order ... Lesson # Version - Name

Adm 101 - Administrative Policies

10 ... Accounting - Forms, Accounts, Reports

10 ... Expense #1 - Completing Expense Reports

20 ... Account #1 - Setting Up Accounts

30 ... Income #1 - Receiving Money

40 ... YearEnd #1 - Year End Processing

20 ... Budgeting - Company Procedures

10 ... Intro #1 - Introduction to Budgeting

30 ... Capital - Using Money to Better the Company

10 ... Cash #1 - Using cash to pay for services

20 ... Credit #1 - Using credit cards - personal & company

Course - Sample Course

10 ... Subject 1 - Sample Subject 1

10 ... Lesson #1 - Sample Lesson

Test - Test Course

10 ... Test - Test Subject

10 ... Test #1 - Test Lesson

Answer Frequency by Exam

30-Jun-93

Course, Subject, Lesson, Version	Exam type, #	Q and A	A (s)	B (s)	C (s)	D (s)	E (s)
----------------------------------	--------------	---------	-------	-------	-------	-------	-------

Course - Sample Course
10 ... Subject 1 - Sample Subject 1
10 ... Lesson # 1 - Sample Lesson

Quiz # 1

1 OK=A

2	0	0	0	1
---	---	---	---	---

2 OK=B

1	1	0	0	0
---	---	---	---	---

3 OK=C

1	0	3	0	0
---	---	---	---	---

Lesson Usage Summary

30-Jun-93

Hours

Course Subject Lesson/Version	Average	Minimum	Maximum	StDev
Adm 101 - Administrative Policies				
10 . Accounting - Forms, Accounts, Reports				
10 . Expense #1 - Completing Expense Reports	02:04	01:01	03:06	01:02

History by Lesson

30-Jun-93

Course, Subject, Lesson/Version

Id ... Name	Date	Completed?	Grade	Hours	Bookmark	Approved?
-------------	------	------------	-------	-------	----------	-----------

Adm 101 - Administrative Policies

10 .. Accounting - Forms, Accounts, Reports

10 .. Expense #1 - Completing Expense Reports

0123456789 ... Doe, John .	6/5/93	Yes	B	02:05	9	No
1234567890 ... Estes, John Q.	5/15/93	Yes	C	03:06	9	No
585420974 ... Estes, William P.	5/5/93	No		01:01	1	No

History by Student Name

30-Jun-93

Student Name ... Id

Course, Subject, Lesson/Version	Date	Completed?	Grade	Hours	Bookmark	Approved?
Doe, John . # 0123456789						
Adm 101 - Administrative Policies	6/5/93	Yes	B	02:05	9	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						
Estes, John Q. # 1234567890						
Adm 101 - Administrative Policies	5/15/93	Yes	C	03:06	9	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						
Estes, William P. # 585420974						
Adm 101 - Administrative Policies	5/5/93	No		01:01	1	No
10 .. Accounting - Forms, Accounts, Reports						
10 .. Expense #1 - Completing Expense Reports						

Catalog

30-Jun-93

Course - Name

Order ... Subject - Name

Order ... Lesson # Version - Name

Adm 101 - Administrative Policies

10 ... Accounting - Forms, Accounts, Reports

10 ... Expense #1 - Completing Expense Reports

20 ... Account #1 - Setting Up Accounts

30 ... Income #1 - Receiving Money

40 ... YearEnd #1 - Year End Processing

20 ... Budgeting - Company Procedures

10 ... Intro #1 - Introduction to Budgeting

30 ... Capital - Using Money to Better the Company

10 ... Cash #1 - Using cash to pay for services

20 ... Credit #1 - Using credit cards - personal & company

Course - Sample Course

10 ... Subject 1 - Sample Subject 1

10 ... Lesson #1 - Sample Lesson

Test - Test Course

10 ... Test - Test Subject

10 ... Test #1 - Test Lesson

APPENDIX D

FSB/SPT BATTALION STAFF

- COURSE OUTLINES

FSB/SPT BATTALION STAFF - COURSE OUTLINES

<u>Course Outline</u>	<u>Title</u>	<u>Page</u>
E	FSB/Spt Bn - Staff Common Core Subjects	D-1a, b
F	FSB - Support Operations Course	D-2
G	FSB - S2/S3 Course	D-3
H	Spt Bn - S2 Course	D-4
I	Spt Bn - Brigade Material Management Officer (BMMO)	D-5
J	Spt Bn - S3 Course	D-6
K	FSB/Spt Bn S1 Course	D-7
L	FSB/Spt Bn S4 Course	D-8
M	FSB/Spt Bn XO Course	D-9

Estimated Hours are based on preliminary training approaches and are subject to change as the lessons are developed.

FSB/SPT BN STAFF COMMON CORE SUBJECTS

FSB/SPT - * 4 hrs

E.1. Airland Battle Tenets (BENNING)

E.2. Command and Control (BENNING)

- 2.1. Principals
- 2.2. Organizational relationships
- 2.3. Order process
- 2.4. Automation and communications systems

E.3. Terms and Graphics (BENNING)

E.4. Military Briefing (BENNING)

E.5. Team Building (BENNING)

- 5.1 Olmstead's model

E.6. Organization and Functions

- 6.1. Organization and mission
- 6.2. Task organization
- 6.3. Battlefield locations
- 6.4. Sustainment planning
- 6.5. Deep operations

E.7. Support Concepts

- 7.1. Forward support
- 7.2. Area support

E.8. CSS Sustainment Functions

- 8.1. Sustaining the soldier
- 8.2. Arming
- 8.3. Fueling
- 8.4. Fixing
- 8.5. Moving
- 8.6. Protecting

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB/SPT BN STAFF COMMON CORE SUBJECTS -

Table D - 1a

12/16/93

FSB/SPT BN STAFF COMMON CORE SUBJECTS (CONT.)

E.9. CSS Sustainment Imperatives

- 9.1. Anticipation**
- 9.2. Integration**
- 9.3. Continuity**
- 9.4. Responsiveness**
- 9.5. Improvisation**

E.10. CSS Operations

- 10.1. Defense fundamentals**
- 10.2. Offense fundamentals**

E.11. Planning Factors for CSS Sustainment

- 11.1. CDR's priority for support**
- 11.2. Consumption factors for the type of operations being planned**
- 11.3. Status of supply stockage levels and critical shortages**
- 11.4. Critical weapons systems**
- 11.5. Threat to CSS operations in rear and forward areas**
- 11.6. Practical contingencies that may have to be supported**
- 11.7. Location of supporting and supported facilities**
- 11.8. Location of main supply routes**
- 11.9. Effects of terrain and weather on support activities**

***estimated hours of CBI to be developed by the Camp Dodge team**

**- FSB/SPT BN STAFF COMMON CORE SUBJECTS -
Table D - 1b**

12/16/93

FSB SUPPORT OPERATIONS OFFICER COURSE - SPO * 10 hrs

F.1. Analyze Mission

* 30 min

F.2. Develop Support Operations Estimate

* 1 hr

F.3. Plan CSS Operations

* 4 hrs

- 3.1. Supply support (minus class VII and IX)
- 3.2. Maintenance support
- 3.3. Medical support
- 3.4. Transportation support
- 3.5. Field services support
- 3.6. Special logistical operations

F.4. Develop NBC Contingency Plan

* 30 min

F.5. Provide Input to BDE CSS Annex

* 30 min

F.6. Provide Input to FSB OPLAN/OPORD

* 30 min

F.7. Coordinate CSS Operations

* 3 hrs

- 7.1. Supplies (minus class VIII and IX)
- 7.2. Maintenance support
- 7.3. Medical support
- 7.4. Transportation support
- 7.5. Field services support
- 7.6. Special logistics operations
- 7.7. GRREG collection point

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB SUPPORT OPERATIONS OFFICER COURSE -
Table D - 2

12/16/93

FORWARD SUPPORT BATTALION

S2/3 - 2 hrs
MOS 96B

G.1. Analyze Mission

G.2. Develop intelligence estimate

2.1. Analyze terrain

2.2. Identify priority information requirements (PIR)

2.3. Identify information requirements (IR)

G.3. Prepare an Intelligence Summary (INTSUM)

G.4. Analyze Courses of Action (COA's)

G.5. Prepare an Information Collection Plan

G.6. Prepare an Operations Estimate

G.7. Prepare an OPLAN/OPORD

G.8. Plan/Oversee OPSEC Support

G.9. Coordinate with BN/BDE Staff

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB/SPT BN STAFF S2/3 -
Table D - 3

12/16/93

SUPPORT BATTALION

S2 - * 2 hrs

MOS 96B

H.1. Analyze mission.

H.2. Develop intelligence estimate

2.1. Analyze terrain

2.2. Identify priority information requirements (PIR)

2.3. Identify information requirements (ir)

H.3. Prepare an intelligence summary (INTSUM)

H.4. Analyze courses of action (COA's)

H.5. Prepare an information collection plan

H.6. Coordinate with BN/BDE staff

H.7. Provide intelligence support

* estimated hours of CBI to be developed by the Camp Dodge team

- SUPPORT BATTALION - S2-

Table D - 4

12/16/93

BRIGADE MATERIAL MANAGEMENT OFFICER

BMMO - * 4 hrs

I.1. Mission Analysis

I.2. Develop a Support Operations Estimate

I.3. Plan CSS Activities in BSA

I.4. Prepare Continuity of Operations Plan (COOP)

I.5. Establish the BMMC

I.6. Coordinate Class I, II, IV and Water Support

I.7. Coordinate Class III Support

I.8. Coordinate Class V Support

I.9. Coordinate Transportation Support

I.10. Coordinate Field Services Support

I.11. Coordinate Maintenance and Class IX Support

I.12. Manage Maintenance

I.13. Manage Supplies

* estimated hours of CBI to be developed by the Camp Dodge team

- BRIGADE MATERIAL MANAGEMENT OFFICER -

Table D - 5

SUPPORT BATTALION

S3 - * 2 hrs

J.1. Analyze Mission
J.2. Analyze COA's
J.3. Develop Operations/Commanders Estimate
J.4. Develop OPLAN/OPORD and Annexes
J.5. Plan Occupation of BSA
J.6. Plan CSS Activities in Brigade Support Area
J.7. Plan BSAS Defense
J.8. Plan the Move
J.9. Coordinate Transportation Support
J.10. Supervise OPSEC Program
J.11. Direct Rear Operations
J.12. Supervise NBC Defense Operations
J.13. Operate Base Cluster Operations Center (BCOC)
J.14. Direct ADC Operations
J.15. Coordinate3 Reconstitution Activities

* estimated hours of CBI to be developed by the Camp Dodge team

- SUPPORT BATTALION - S3 -

Table D - 6

12/16/93

FSB/SPT BN

S-1 - * 2 hrs

K.1. Operations Order/Planning

K.2. Battalion Replacement Operations

K.3. Battalion Strength Management

K.4. Battalion Personnel Accounting and Strength Reporting

K.5. Battalion Casualty Management

K.6. Personnel Database Operations

K.7. Personnel Information Management

K.8. Manage Enemy Prisoner of War (EPW) & Civilian Internee (CI)

K.9. Battalion Health and Medical Support

K.10. Battalion Morale, Welfare, and Recreation Support

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB/SPT BN S-1-

Table D - 7

12/16/93

FSB/SPT BN

S4 - * 2 hrs

L.1. Analyze Mission

L.2. Develop a Logistics Estimate

- 2.1. Determine information requirements
- 2.2. Assemble required information
- 2.3. Prepare estimate
- 2.4. Disseminate logistics estimate

L.3. Provide Input to FSB/SPT BN OPLAN/OPORD

- 3.1. Plan/supervise establishment of logistics operations center

L.4. Provide Logistics Support for the FSB

- 4.1. Coordinate maintenance operations
- 4.2. Coordinate BN supply activities
- 4.3. Coordinate BN services
- 4.4. Coordinate transportation requiremenmts

L.5. Plan Rear Operations with S2/3 Section

- 5.1. Develop logistical plan
- 5.2. Develop ADC plan
- 5.3. Establish control and assessment CP

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB/SPT BN - S4 -

Table D - 8

12/16/93

FSB/SPT BN EXECUTIVE OFFICER

XO - * 5 hr

M.1. Supervise Staff Planning Process (Plan CSS OPNS)

- 1.1. Analyze mission
- 1.2. Staff estimates
- 1.3. Development of OPLAN/OPORD

M.2. Supervise Movement of BSA

- 2.1. Plan movement
- 2.2. Coordinate movement

M.3. Supervise Establishment of BSA

- 3.1. Plan occupation
- 3.2. Supervise quartering party activities
- 3.3. Establish communications
- 3.4. Provide command and control
- 3.5. Employ OPSEC

M.4. Supervise CSS Operations

- 4.1. Maintain communications
- 4.2. Provide command and control
- 4.3. Provide CSS support

M.5. Supervise Conduct of Rear Operations

- 5.1. BCOC OPNS
- 5.2. Response to BSA threat
- 5.3. Area damage control
- 5.4. Continue CSS OPNS

* estimated hours of CBI to be developed by the Camp Dodge team

- FSB/SPT BN EXECUTIVE OFFICER -

Table D - 9

12/16/93

APPENDIX E

BATTLE-FOCUS

AND

PRIORITY

BATTLE-FOCUS AND PRIORITY

DESCRIPTION	PAGE
-Mission Essential Task List (METL) - Co A, B, & C - FSB	E-1
-Supply Company - "Request, Receive, and Issue" - Collective Task List	E-2
-Maintenance Company - "Conduct DS Maint & Repair Parts Ops" - Collective Task List	E-3
-Medical Company - "Perform Health Service Support Ops" - Collective Task List	E-4
-Supply Company -Priority Lane Individual Task List	E-5
-Maintenance Company -Priority Lane Individual Task List	E-6
-Medical Company - Priority Lane Individual Task List	E-7a,b
-Defend Company Sector Lane - Individual Tasks for Gross Collective Task	E-8
-Decision Criteria for CBI Development	E-9
-Critical MOSs (SL 1/2) and Critical NCO MOSs	E-10
-Schematic Medical Company Lane	E-11

This appendix is the battle-focus analysis for this effort developed by the ARPA Support Staff. The Mission Essential Task List (METL), page E-1, is the gross level collective missions of the Supply, Maintenance, and Medical companies. They were developed from contact with the 116th FSB, 10 ARNG, and the 148th Spt BN - GA ARNG. Those marked with an '*' are the highest priority tasks.

Pages E-2, E-3, and E-4 are the lists of collective tasks that make up the priority gross collective missions for the Supply, Maintenance, and Medical companies, respectively. These listings were developed from the unit Mission Training Plans (MTP). The most critical collective tasks were identified by the FSB and Spt BN and verified by input from the NTC. Those tasks are marked with an '*' and lane training is being developed for them in this effort.

Pages E-5, E-6, E-7a, b are the individual tasks that must be performed to accomplish the priority lanes. They were developed from the MTP's and the Soldier Training Plans (STP) accordingly. Those tasks marked with an '*' were found to be difficult to perform in the armory during IDT and are targeted for CBI development.

Page E-8 is the individual task list for the Defend Company Lane. Those tasks marked with an '*' are targeted for CBI development.

These pages constitute the battle-focus analysis for two gross level tasks for each company (principle mission and defend). They were developed by the ARPA Support Team and will be a primary reference for this effort.

MISSION ESSENTIAL TASK LIST					
COMPANY A SUPPLY COMPANY	RELOCATE COMPANY TO A NEW OPERATING SITE	ESTABLISH COMPANY AREA OF OPERATIONS	* REQUEST, RECEIVE, AND ISSUE SUPPLIES	DEFEND ASSIGNED AREA	MOBILIZE
COMPANY B MAINTENANCE COMPANY	RELOCATE COMPANY TO A NEW OPERATING SITE	ESTABLISH COMPANY AREA OF OPERATIONS	* CONDUCT DIRECT SUPPORT MAINTENANCE AND REPAIR PARTS SUPPLY SERVICE OPERATIONS	DEFEND ASSIGNED AREA	MOBILIZE
COMPANY C MEDICAL COMPANY	RELOCATE COMPANY TO A NEW OPERATING SITE	ESTABLISH COMPANY AREA OF OPERATIONS	* PERFORM HEALTH SERVICE SUPPORT OPERATIONS	DEFEND COMPANY AREA	MOBILIZE

Table E-1

SUPPLY COMPANY
METL - REQUEST, RECEIVE, AND ISSUE SUPPLIES

COLLECTIVE TASK

CONDUCT EQUIPMENT DECON
 10-2-1019
 EMPLOY OPSEC
 10-2-1016
 PREPARE COMPANY FOR CHEMICAL ATTACK
 10-2-R202
 RESPOND TO CHEMICAL ATTACK
 10-2-R334
 PERFORM CHEMICAL DECONTAMINATION
 10-2-1018
 PREPARE FOR FRIENDLY NUCLEAR STRIKE
 10-2-R327
 RESPOND TO NUCLEAR ATTACK
 10-2-1020
 PERFORM RADIOLOGICAL DECONTAMINATION
 10-2-R207
 DEFEND AGAINST LEVEL I ATTACK
 10-2-1021
 USE PASSIVE AIR DEFENSE
 10-2-R307
 TAKE ACTIVE AIR DEFENSE MEASURES
 10-2-R308
 SUPERVISE SUPPLY OPNS
 10-2-0717
 PROVIDE CLASS I,II,III(PKG), IV AND VII
 10-2-0029
 *PROVIDE CLASS III (BULK) SUPPLIES
 10-2-0033
 PROVIDE CLASS V SUPPLIES
 10-2-0009
 PROVIDE PERSONNEL AND ADMINISTRATIVE SUPPORT
 10-2-1015
 PROVIDE COMPANY SUPPLY SUPPORT
 10-2-C320
 PERFORM COMPANY-LEVEL MAINTENANCE
 10-2-R322
 PERFORM FIELD SANITATION FUNCTIONS
 10-2-R315
 COMBAT BATTLEFIELD STRESS
 10-2-R303
 PERFORM RISK MANAGEMENT PROCEDURES
 10-2-R326
 PROCESS ENEMY PRISONERS OF WAR
 10-2-R304
 PROCESS CAPTURED DOCUMENTS AND EQUIPMENT
 10-2-R305
 TREAT CASUALTIES
 8-2-0003
 EVACUATE CASUALTIES
 10-2-R316
 PERFORM COMPANY GRAVE REGISTRATION OPERATIONS
 10-2-C318
 MAINTAIN COMMUNICATIONS
 10-2-1017

Table E-2

**MAINTENANCE COMPANY METL -
CONDUCT DS MAINTENANCE AND REPAIR PARTS SUPPLY SERVICE OPS OPERATIONS**

COLLECTIVE TASKS

PERFORM MAINTENANCE CONTROL FUNCTIONS

43-2-0001

SUPERVISE PLATOON MAINTENANCE OPNS

43-2-0028

***CONDUCT DS MAINTENANCE OPERATIONS**

43-2-0006

PERFORM SERVICE AND RECOVERY OPNS

43-2-0007

PROVIDE REPAIR PARTS

43-2-0008

PERFORM PERSONNEL AND ADMINISTRATIVE SUPPORT

63-2-0010

PERFORM UNIT LEVEL MAINTENANCE

43-2-C0001

PROVIDE UNIT SUPPLY SUPPORT

10-2-C003

PERFORM PREVENTIVE MEDICINE MEASURES

08-3-C023

EMPLOY PASSIVE AND ACTIVE AIR DEFENSE MEASURES

63-2-0029

DEFEND AGAINST A LEVEL I ATTACK

63-2-0030

RESPOND TO INITIAL EFFECTS OF A NUCLEAR ATTACK

63-2-0031

RESPOND TO RESIDUAL EFFECTS OF A NUCLEAR ATTACK

63-2-0032

RESPOND TO A CHEM/BIO ATTACK

63-2-0033

Table E-3

**MEDICAL COMPANY METL -
PERFORM HEALTH SERVICE SUPPORT OPERATIONS**

COLLECTIVE TASKS

PREPARE COMPANY FOR A CHEMICAL ATTACK
 8-2-R202
 RESPOND TO A CHEMICAL ATTACK
 8-2-R334
 PERFORM CHEMICAL DECONTAMINATION
 8-2-1018
 CONDUCT DETAILED EQUIPMENT DECONTAMINATION
 8-2-1019
 PREPARE FOR A FRIENDLY NUCLEAR STRIKE
 8-2-1020
 RESPOND TO THE INITIAL EFFECTS OF A NUCLEAR ATTACK
 8-2-1020
 RESPOND TO THE RESIDUAL EFFECTS OF A NUCLEAR ATTACK
 8-2-R328
 PERFORM RADIOLOGICAL DECONTAMINATION
 8-2-R207
 PROVIDE EMERGENCY TREATMENT
 8-2-0313
 TREAT NBC CONTAMINATED CASUALTIES
 8-2-0232
 PROVIDE DIAGNOSTIC SERVICES
 8-2-0315
 PROVIDE SICK CALL SERVICES
 8-2-0316
 PROVIDE DENTAL SERVICES
 8-2-0317
 PROVIDE PATIENT HOLDING
 8-2-0318
 *PROVIDE GROUND AMBULANCE EVACUATION SUPPORT
 8-2-0319
 PROVIDE PERSONNEL AND ADMINISTRATIVE SUPPORT
 8-2-1015
 PROVIDE UNIT AND MEDICAL SUPPLY SUPPORT
 8-2-1015
 PERFORM COMPANY-LEVEL MAINTENANCE
 8-2-R322
 RECEIVE RESUPPLY BY AIRDROP
 10-2-C319
 RECEIVE EXTERNAL SLING LOAD RESUPPLY
 55-2-C325
 PERFORM FIELD SANITATION FUNCTIONS
 8-2-R315
 COMBAT BATTLEFIELD STRESS
 8-2-R303
 PERFORM RISK MANAGEMENT PROCEDURES
 8-2-R326
 PROCESS ENEMY PRISONERS OF WAR
 8-2-R304
 PROCESS CAPTURED DOCUMENTS AND EQUIPMENT
 8-2-R305
 TREAT COMPANY CASUALTIES
 8-2-0314
 PERFORM COMPANY GRAVES REGISTRATION OPERATIONS
 10-2-C318
 SUPERVISE HEALTH SERVICE SUPPORT OPERATIONS
 8-2-0312

Table E-4

SUPPLY COMPANY/SUPPLY AND TRANSPORT COMPANY

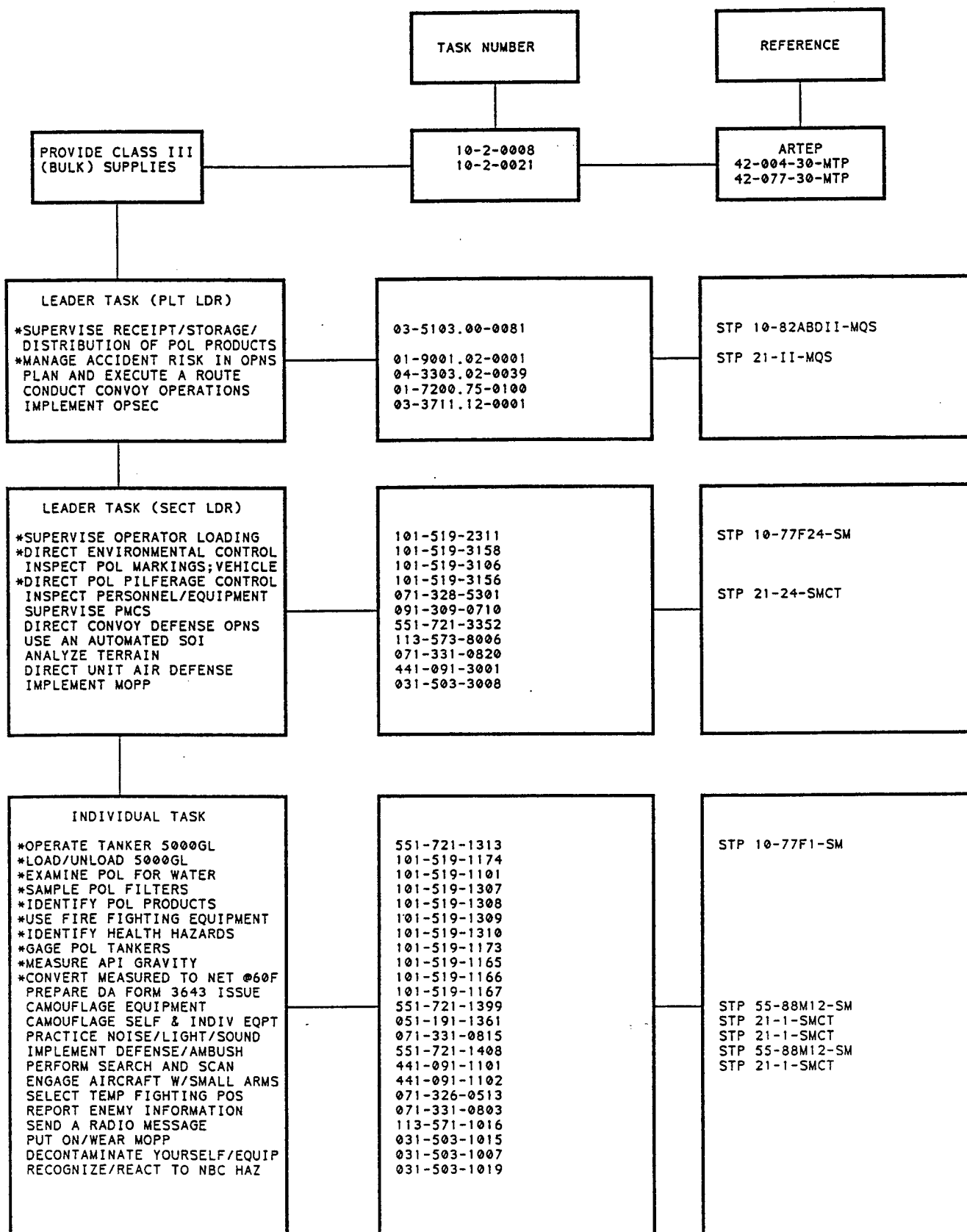


Table E-5

MAINTENANCE CO, SPT BN, SEP BDE

PROVIDE ON-SITE MAINTENANCE SPT	TASK NUMBER	REFERENCE
	43-2-0005.5 43-2-0006.2/4	ARTEP 43-009-30 MTP
LEADER TASK-PLT LDR/SGT *DISPATCH ON-SITE MAINT SPT TM IMPLEMENT OPERATIONS SECURITY *SUPV ORG & DEPLMNT OF MST's DIRECT VEH & EQUIP RCYV OPNS " " " " " " PREPARE A STRIP MAP IMPLEMENT MOPP BASED ON THREAT OR DIRECTION SUPERVISE UNIT RESPONSE TO A CHEM OR BIO HAZARD	01-4730.27-2002 03-3711.12-0001 091-409-0621 03-4995.90-0010 091-309-0711 551-721-3359 04-5030.00-2013 04-5030.00-2006	STP 9-918CII-MQS STP 9-63H34-SM-TG STP 21-II-MQS STP 21-24-SMCT
LEADER TASK-MST TM CH & SEC SGT *ORGANIZE AND DEPLOY MST *INSPECT & TROUBLESHOOT TRACK IMPLEMENT SHOP SAFETY PROGRAM ANALYZE TERRAIN SUPERVISE PMCS IMPLEMENT MOPP SUPERVISE POSITIONING OF CHEM AGENT ALARM SUPERVISE HASTY DECON CONDUCT A DEFENSE BY A SQUAD CONSOL SQD FOLLOWING CONTACT REORGANIZE A SQUAD FOLLOWING ENEMY CONTACT *SUPERVISE BDAR	091-309-0603 091-362-0018 091-309-0602 071-331-0820 091-309-0710 031-503-3008 031-504-3001 031-504-3003 071-430-0002 071-430-0003 071-430-0004 091-309-8000	STP 9-63H34-SM-TG STP 9-63H34-SM-TG STP 9-63H34-SM-TG STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT STP 21-24-SMCT
INDIVIDUAL TASK *REPAIR DIESEL POWER PLANT/PACK *SYSTEM TROUBLESHOOT TO CORRECTIVE ACTION RADIO SETS *REPAIR TRAVERSING SYSTEMS *REPAIR BFV TOW 2 ISU *ESTABLISH AND MAINTAIN MAINTENANCE FILES ORIENT MAP BY TERRAIN ASSOC DETERMINE LOCATION BY TERRAIN ASSOCIATION RECOGNIZE AND REACT TO CHEM OR BIO HAZARD SELECT TEMPORARY FIGHTING POSITIONS MOVE UNDER DIRECT FIRE ENGAGE TARGETS WITH AN M16A1/2 *PERFORM BDAR	091-162-0105 113-587-0048 091-144-0103 093-441-1603 101-539-1408 071-329-1012 071-329-1005 031-503-1019 071-326-0513 071-326-0502 071-311-2007 091-169-8000	STP 9-63H12-SM STP 11-29E1-SM STP 9-45K12-SM STP 9-27E13-SM-TG STP 10-76C12-SM-TG STP 21-1-SMCT STP 21-1-SMCT STP 21-1-SMCT STP 21-1-SMCT STP 21-1-SMCT STP 21-1-SMCT STP 9-63H12-SM

Table E-6

MEDICAL CO, FORWARD SUPPORT BATTALION

AMBULANCE PLATOON

PROVIDE GROUND AMBULANCE EVACUATION SUPPORT

<p>PREPARES PATIENTS FOR EVACUATION.</p> <p>ARTEP 8-437-30-MTP TASK NO. 8-2-0319.1</p>	<p>TASK NUMBER</p>	<p>REFERENCE</p>
<p>LEADER TASK</p> <ol style="list-style-type: none"> 1. USE AN OVERLAY. *2. SELECT A MOVEMENT ROUTE USING A MAP. *3. ALLOCATE RESOURCES FOR EACH LOCATION. *4. SELECT AN AMBULANCE EXCHANGE PT/SHUTTLE SYSTEM. 5. PREPARE A STRIP MAP 6. MAINTAIN COMMUNICATIONS 	<ol style="list-style-type: none"> 1. 071-329-1019 2. 071-326-0515 3. IAW FM 8-55 PARA 4-3 4. PARA 4-5 5. 551-721-3359 6. 113-572-4008/5005 	<ol style="list-style-type: none"> 1. STP 21-24 SMCT 2. STP 21-24 SMCT 3. FM 8-55 FM 8-10-6 4. FM 8-10-6 5. STP 21-24 SMCT 6. STP 21-24 SMCT
<p>INDIVIDUAL TASK</p> <ol style="list-style-type: none"> *1. TRIAGE CASUALTIES ON A CONVENTIONAL BATTLEFIELD. *2. PROVIDE EMERGENCY MEDICAL TREATMENT. *3. INITIATE INTRAVENOUS INFUSION. 4. PLACE PATIENTS ON LITTERS. 5. INITIATE FIELD MEDICAL CARD 	<ol style="list-style-type: none"> 1. 08-833-0080/0082 2. 081-831-0018/0019/0046/0043/0044 081-831-0035/0038/0039 081-831-1016/1017 081-833-0016/0017/0019/0015/0045 081-833-0046/0049/0050/0052/0070 081-833-0062/0072/0073/0047/0031 3. 081-833-0033/0034 4. IAW FM 8-10-6 5. 081-831-0033 	<ol style="list-style-type: none"> 1. STP 8-91B15-SM-TG 2. STP 8-91-SM STP 21-1-SMCT STP 8-91B15-SM-TG 3. STP 8-91B15-SM-TG 4. FM 8-10-6 5. STP 8-91-SM
<p>EVACUATES PATIENTS.</p> <p>ARTEP 8-437-30-MTP TASK NO. 8-2-0319.2</p>		
<p>LEADER TASK</p> <ol style="list-style-type: none"> 1. PERFORM LOADING/EVACUATION OF PATIENTS. 2. PERFORM TEAM EVACUATION PROCEDURES. 	<ol style="list-style-type: none"> 1. 03-8310.00-4003 2. 03-8310.00-4004 	<ol style="list-style-type: none"> 1. STP 8-II-MQS 2. STP 8-II-MQS
<p>INDIVIDUAL TASK</p> <ol style="list-style-type: none"> 1. PREPARE AMBULANCE TO RECEIVE PATIENTS. 2. LOAD AMBULANCE USING PROPER PROCEDURES. 3. PROVIDE EN ROUTE CARE. 4. UPDATE FIELD MEDICAL CARD. 5. UNLOAD AMBULANCE USING PROPER PROCEDURES. 6. DIRECT-EXCHANGE LITTERS AND MEDICAL EQUIPMENT. 7. PERFORM PATIENT EXCHANGE WITH AIR OR GROUND EVACUATION. 8. SELECT AND MARK HELICOPTER LANDING SITE. 9. GUIDE A HELICOPTER TO A LANDING SITE. 10. CAMOUFLAGE A VEHICLE. 11. IMPLEMENT DEFENSE PROCEDURE WHEN UNDER ENEMY ATTACK OR AMBUSHED IN A TRUCK CONVOY. 	<ol style="list-style-type: none"> 1. PARA 10-1 TO 10-7, 10-12 2. PARA 10-1 TO 10-7, 10-12 3. 081-831-0013/0011/0010/0012 081-831-0018/0019/0046/0047 081-831-0048 4. 081-831-0033 5. PARA 10-1 TO 10-7, 10-12 6. PARA 4-4 7. PARA 10-1 TO 10-7, 10-12, 10-23 TO 10-30 8. 071-334-4002 9. 071-334-4001 10. 551-721-1399 11. 551-721-1408 	<ol style="list-style-type: none"> 1. FM 8-10-6 2. FM 8-10-6 3. STP-8-91-SM 4. STP-8-91-SM 5. FM 8-10-6 6. FM 8-10-6 7. FM 8-10-6 8. STP 8-91B15-SM-TG 9. STP 8-91B15-SM-TG 10. STP 55-88M12-SM 11. STP 55-88M12-SM

Table E-7

MEDICAL CO, FORWARD SUPPORT BATTALION

AMBULANCE PLATOON

PROVIDE AMBULANCE EVACUATION SUPPORT

<p>EVACUATE NBC CONTAMINATED PATIENTS</p> <p>ARTEP 8-437-30-MTP TASK NO. 8-2-0319.3</p>	<p>TASK NUMBER</p>	<p>REFERENCE</p>
<p>LEADER TASK</p> <ol style="list-style-type: none"> 1. IMPLEMENT MOPP LEVEL. 2. LEAD MOPP GEAR EXCHANGE. 3. SUPERVISE VEHICLE DECONTAMINATION. 	<ol style="list-style-type: none"> 1. 031-503-3008 2. 031-503-3009 3. 551-721-3351 	<ol style="list-style-type: none"> 1. STP 21-24 SMCT 2. STP 21-24 SMCT 3. STP 55-88M34-SM-TG
<p>INDIVIDUAL TASK</p> <ol style="list-style-type: none"> 1. OPERATE A VEHICLE IN A CONTAMINATED AREA. 2. EMPLOY APPROPRIATE MOPP LEVEL. 3. TREATMENT OF CHEMICAL CASUALTIES. 4. MARK CONTAMINATED PATIENTS. 5. COORDINATE WITH CLEARING STATION OF NBC CASUALTIES 6. UNLOAD PATIENTS AT DESIGNATED DECONTAMINATION STATION. 7. PERFORM SELF DECONTAMINATION 	<ol style="list-style-type: none"> 1. 551-721-1410 2. 081-503-1004//1015 3. 081-833-0083/0084/0085/0086 081-831-1030/1031 4. IAW TSOP 5. IAW TSOP 6. PARA 10-1 TO 10-7, 10-12 7. 031-503-1007/1023 	<ol style="list-style-type: none"> 1. STP 55-88M12-SM 2. STP 21-1-SMCT 3. STP 8-91B15-SM-TG STP 21-1-SMCT 4. TSOP 5. TSOP 6. FM 8-10-6 7. STP 21-1-SMCT
<p>PREPARES FOR CONTINUATION OF EVACUATION</p> <p>ARTEP 8-437-30-MTP TASK NO. 8-2-0319.4</p>		
<p>LEADER TASK</p> <ol style="list-style-type: none"> 1. SUPERVISE THE MAINTENANCE MANAGEMENT OF MEDICAL SETS. 	<ol style="list-style-type: none"> 1. 03-8310.00-6000 	<ol style="list-style-type: none"> 1. STP 8-II-MQS
<p>INDIVIDUAL TASK</p> <ol style="list-style-type: none"> 1. REPLENISH MEDICAL EQUIPMENT SET. 2. PERFORM PMCS ON EQUIPMENT. 	<ol style="list-style-type: none"> 1. IAW UNIT ASSEMBLAGE 2. IAW TECHNICAL MANUAL 	<ol style="list-style-type: none"> 1. UA-0256 2. IAW TM

Table E-7

DEFEND COMPANY SECTOR

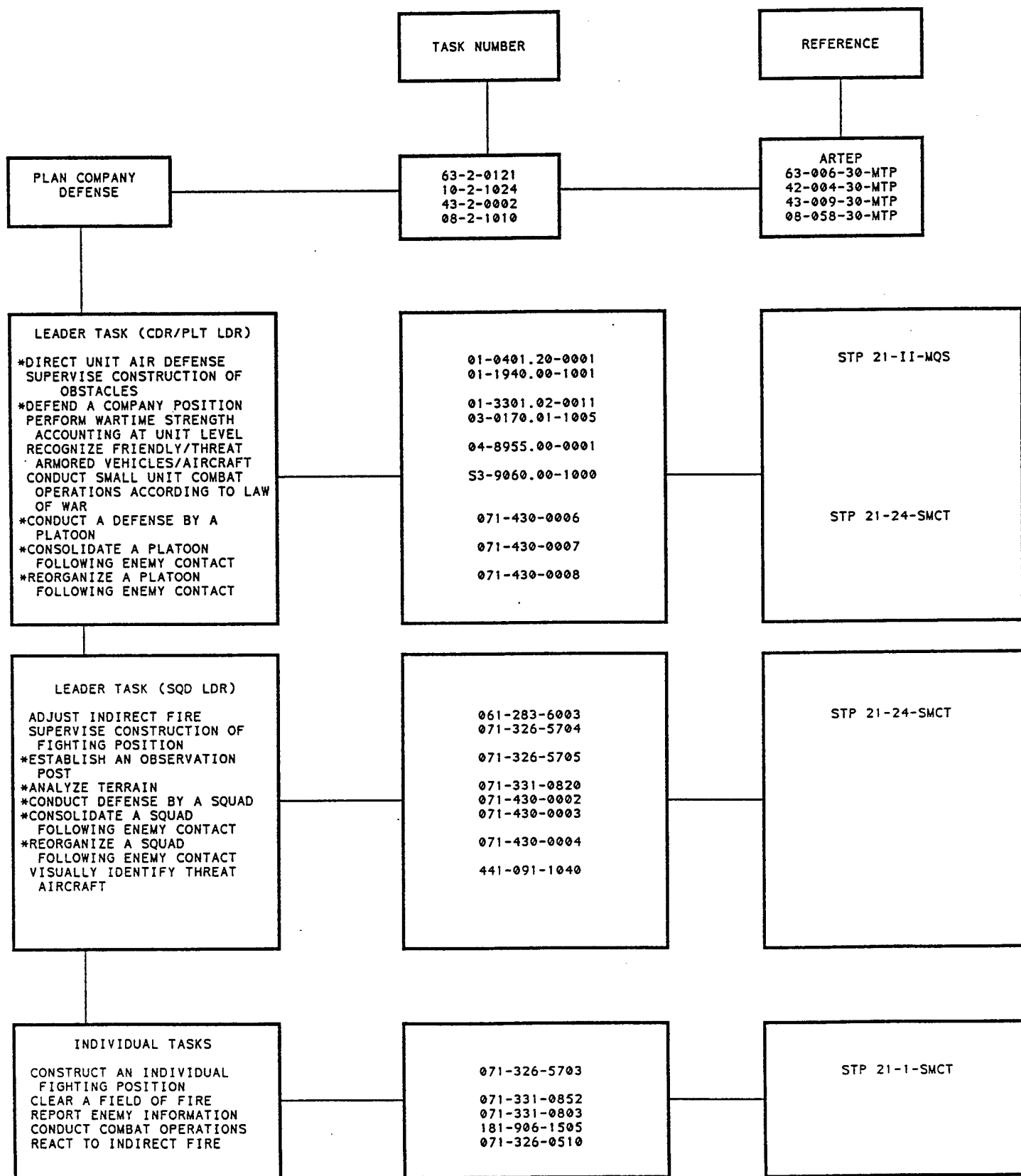


TABLE E-8

CRITICAL MOS'S (SL 1/2)

- * 27E TOW/DRAGON REPAIRER
- * 29E RADIO REPAIRER
- * 45K TURRET REPAIRER
- 52D GENERATOR REPAIRER
- 54E NBC SPECIALIST
- 55B AMMUNITION HANDLER
- 63B ORGANIC EQUIPMENT REPAIRER
- * 63H TRACK VEHICLE REPAIRER
- 63W WHEELED VEHICLE REPAIRER
- 76J MEDICAL SUPPLY SPECIALIST
- * 77F FUEL SPECIALIST
- 88M TRUCK DRIVER
- * 91B MEDICAL SPECIALIST
- 92A SUPPLY SPECIALIST
- 92Y UNIT SUPPLY SPECIALIST

* MOS'S COVERED BY PRIMARY LANES

CRITICAL NCO MOS'S

- 55B AMMUNITION
- * 63H MAINTENANCE
- * 63Z MAINTENANCE
- * 77F FUEL SUPERVISOR
- 88M TRANSPORTATION SUPERVISOR
- * 91B MEDICAL SUPERVISOR
- 92Y SUPPLY
- 92Z SUPPLY
- 96B INTELLIGENCE

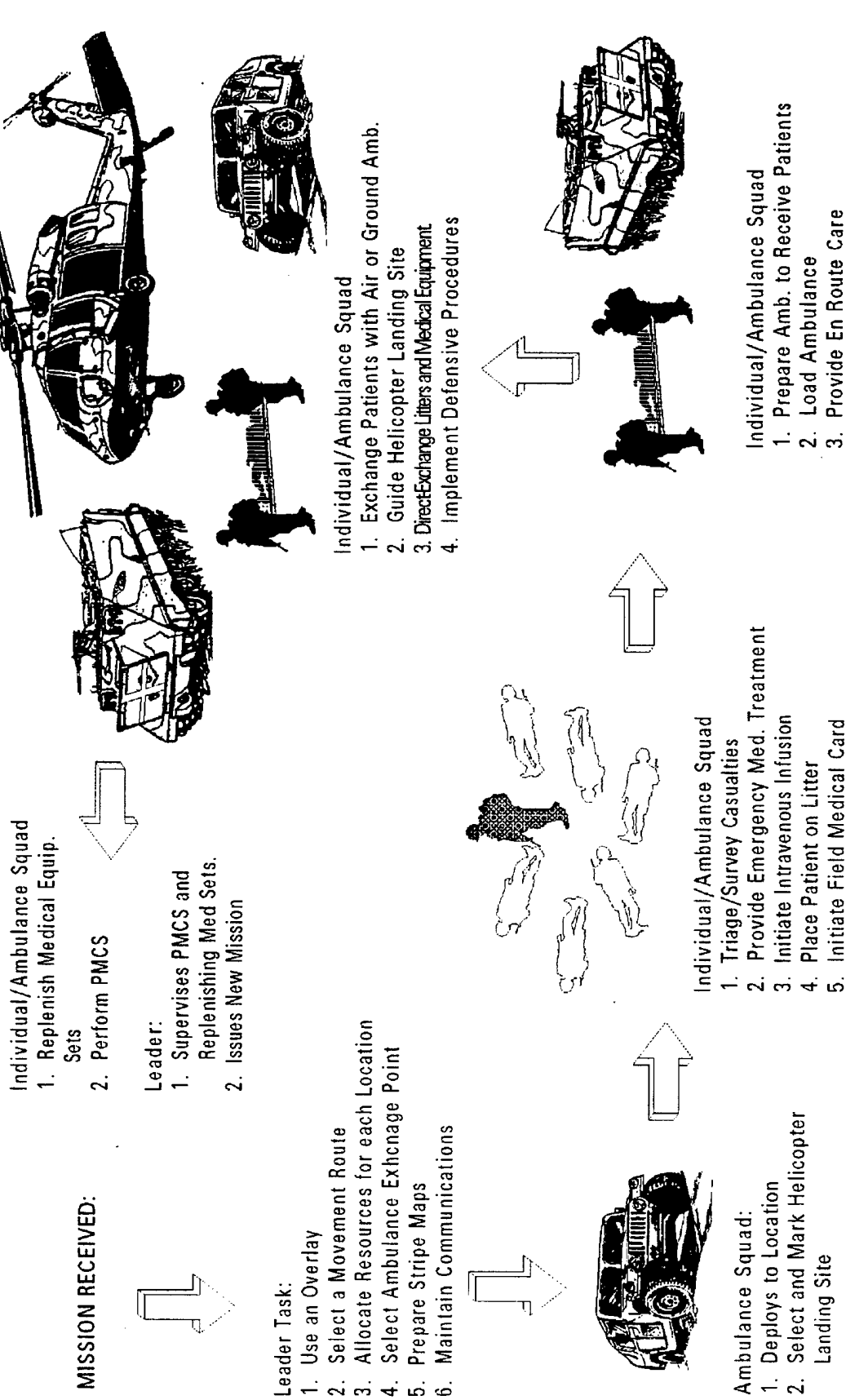
* MOS'S COVERED BY PRIMARY LANES

DECISION CRITERIA FOR CBI DEVELOPMENT

REASONS FOR SELECTING TASKS FOR CBI DEVELOPMENT:

- COMPLEXITY OF TASK - DIFFICULTY OF TRAINING THE TASK DUE TO THE TECHNICAL SKILL AND VARIOUS MANUALS THAT MUST BE USED TO CONDUCT THE TRAINING
- LOW DENSITY CRITICAL TASK - TASK THAT ARE CRITICAL TO THE MISSION OF THE UNIT, BUT ONLY INVOLVE A FEW INDIVIDUALS
- EQUIPMENT SHORTAGE - LACK OF EQUIPMENT TO TRAIN ON
- SUPPORT EQUIPMENT - LACK OF SPECIAL TOOLS OR EQUIPMENT TO CONDUCT TRAINING
- FACILITIES - NOT SUFFICIENT FACILITIES OR TRAINING AREAS TO CONDUCT TRAINING
- LACK OF TRAINERS - QUALIFIED TRAINERS NOT AVAILABLE
- TIME INTENSIVE - REQUIRES A LARGE AMOUNT OF TIME TO PREPARE AND SET-UP FOR THE TRAINING
- REDUCED LEARNING TIME - STUDIES INDICATE THAT INTERACTIVE LEARNING IS AS MUCH AS 50% MORE EFFICIENT THAN TRADITIONAL TRAINING TECHNIQUES
- REDUCED COST - HANDS ON LANE TRAINING IS VERY RESOURCE INTENSIVE
- INSTRUCTIONAL CONSISTENCY - HANDS ON TRAINING BY EACH FIRST LINE SUPERVISOR CAN BE INCONSISTENT
- PRIVACY - PEER PRESSURE DOES NOT EFFECT LEARNING. EACH STUDENT CAN WORK ON A TASK UNTIL MASTERY WITHOUT FEAR OF BEING CRITICIZED BY PEERS
- MASTERY OF LEARNING - A STRUCTURED PROGRAM OF INSTRUCTION PROVIDES A MAP FOR LOGICAL LEARNING
- INCREASED RETENTION - INTERACTION WITH EACH STUDENT PROVIDES INCREASED RETENTION OVER TIME
- INCREASED SAFETY - STUDENTS CAN LEARN POTENTIALLY DANGEROUS TASKS WITHOUT RISK
- INCREASED MOTIVATION - INTERACTIVE LEARNING HAS PROVEN TO BE VERY MOTIVATIONAL FOR THE STUDENT
- INCREASED ACCESS - QUALITY TRAINING CAN BE AVAILABLE TO THE STUDENT AT THE TIME AND PLACE CONVENIENT TO EACH STUDENT

AMBULANCE PLATOON, MEDICAL COMPANY PROVIDE AMBULANCE EVACUATION SUPPORT



APPENDIX F

FSB/SPT BN COMPANY

CBI LESSON OUTLINES

APPENDIX F

FSB/SPT BN COMPANY CBI LESSON OUTLINES

<u>Course Outline</u>	<u>Title</u>	<u>Page</u>
A	Provide Class III (Bulk) Supplies	F-1
B	Provide On-Site Maintenance	F-2a,b
C	Provide Ground Ambulance Evacuation Support	F-3
D	Defend Company Area	F-4

**ESTIMATED HOURS ARE BASED ON PRELIMINARY TRAINING APPROACHES
AND ARE SUBJECT TO CHANGE AS THE LESSONS ARE DEVELOPED.**

PROVIDE CLASS III (BULK) SUPPLIES

I. SUBJECT. Class III Leader Training

Officers/NCOs - MOS77F25

A-1. Supervise receipt and storage of POL products * 2.25 hrs

- 1.1 Manage accident risk in operations
- 1.2 Select supply point location
- 1.3 Supervise loading/unloading vehicle
- 1.4 Supervise bulk POL inventories
- 1.5 Supervise POL pump/manifold operations

A-3. Direct POL environmental and security controls * 1 hr

- 3.1 Monitor spill prevention
- 3.2 Direct response to spills on shore
- 3.3 Supervise spill cleanup
- 3.4 Determine security requirements for storage site
- 3.5 Direct checkpoint personnel
- 3.6 Determine security hazards for hose lines

II. SUBJECT. Class III Individual Training

Petroleum Supply Specialist - MOS77F1

A-2. Inspection of POL products * 1.5 hrs

- 2.1 Identify POL products
- 2.2 Examine POL for water
- 2.3 Measure API gravity
- 2.4 Convert measured to net at 60 degrees F
- 2.5 Sample POL fuels for filter effectiveness
- 2.6 Gage POL tankers

A-4. Tanker operations and safety * 1 hr

- 4.1 Perform PMCS on tank trailer
- 4.2 Load 5000 gallon tank trailer
- 4.3 Unload 5000 tank trailer
- 4.4 Identify health hazards
- 4.5 Use POL fire fighting equipment

* estimated hours of CBI to be developed by the Camp Dodge team
- PROVIDE CLASS III (BULK) SUPPLIES -

Table F - 1

12/16/93

PROVIDE ON-SITE MAINTENANCE

Shop Officer

Shop NCO

MST Chief & Members

I. SUBJECT. Maintenance Leader Training

MOS-63H

B-1. Inspect and troubleshoot tracked vehicle automotive systems * 1 hr 15 min

- 1.1. Review work order
- 1.2. Find the right manuals
- 1.3. Perform function test
- 1.4. Perform initial inspection
- 1.5. Determine disposition
- 1.6. Complete TAMMS forms

B-6. Dispatch / supervise / organize and deploy maintenance support team * 2 hr

- 6.1. Determine task organization and equipment density
- 6.2. Recon route to maintenance site
- 6.3. Coordinate defensive support
- 6.4. Designate team chief and brief on mission
- 6.5. Inspect MST
- 6.6. Dispatch / deploy MST
- 6.7. Establish defense at repair site
- 6.8. Determine disposition of disabled vehicle/equipment
- 6.9. Accomplish possible repairs at site
- 6.10. Recover team and redeploy

B-7. Supervise/perform Battle Damage Assessment and Repair (BDAR) * 45 min

- 7.1. Definitions
- 7.2. BDAR concepts
- 7.3. Perform repairs
- 7.4. Complete TAMMS forms

(NOTE: This entire lesson is joint
leader and individual training)

* estimated hours of CBI to be developed by the Camp Dodge team

- PROVIDE ON-SITE MAINTENANCE -

Table F - 2a

12/16/93

PROVIDE ON-SITE MAINTENANCE

Shop Officer
Shop NCO
MST Chief & Members

II. SUBJECT. Maintenance Individual Training

B-2. Repair diesel power plant/pack	MOS-63H - * 1 hr 15 min
2.1 Select and use applicable references	
2.2 Select and use appropriate tools and test equipment	
2.3 Complete repairs IAW appropriate technical manual	
2.4 Test-operate component or end-item	
2.5 Complete TAMMS forms as required	

B-3. System troubleshoot to corrective action radio sets	MOS-29E - * 1 hr 30 min
3.1. Evaluate system and analyze faults	
3.2. Analyze circuit to identify possible bad items	
3.3. Perform troubleshooting procedures	
3.4. Re-evaluate the radio after repair	
3.5. Complete TAMMS forms	

B-4. Repair traversing system.	MOS-45K - * 45 min
4.1. Select and use applicable references	
4.2. Inspect traversing system	
4.3. Repair traversing system	
4.4. Test traversing system	
4.5. Complete TAMMS forms	

B-5. Repair the Bradley Fighting Vehicle (BFV) TOW Integrated Sight Unit (ISU)	MOS-27E - * 2 hr
5.1. Select and use applicable references	
5.2. Set up for testing	
5.3. Troubleshoot the ISU and isolate the malfunction	
5.4. Obtain replacement component	
5.5. Install replacement component	
5.6. Perform self-test	
5.7. Perform test 97:008	
5.8. Run 180-day verification test	
5.9. Complete TAMMS forms	

* estimated hours of CBI to be developed by the Camp Dodge team
- PROVIDE ON-SITE MAINTENANCE -

Table F - 2b

12/16/93

PROVIDE GROUND AMBULANCE EVACUATION SUPPORT

I. SUBJECT. Evacuation Support Leader Training

Officer/NCOs -MOS 67B/91B25

- | | |
|--------------------------------------|-------|
| C-2. Plan for Evacuation Support | *1 hr |
| 2.1 Select Ambulance Exchange Points | |
| 2.2 Allocate Resources | |

II. SUBJECT. Evacuation Support Individual Training

Medical Specialist - MOS 91B

- | | |
|-----------------------------|--------|
| C-1. Control Bleeding | * 1 hr |
| 1.1 Apply Field Dressing | |
| 1.2 Apply Pressure Dressing | |
| 1.3 Apply Tourniquet | |

- | | |
|-----------------------------|----------|
| C-4. Triage/Survey Patients | * 1.5 hr |
| 4.1 Survey Casualties | |
| 4.2 Triage Casualties | |

- | | |
|---------------------------------------|--------|
| C-5. Treating Respiratory Dysfunction | * 1 hr |
| 5.1 Insert an Oral Pharyngeal Airway | |
| 5.2 Ventilate with Bag-Valve-Mask | |
| 5.3 Administer Oxygen Therapy | |

- | | |
|---|---------|
| C-3. Casualty Management | * 2 hrs |
| 3.1 Treat Casualty With Open Abdominal Wound | |
| 3.2 Apply a Dressing to an Impalement Injury | |
| 3.3 Treat a Casualty With Closed Chest Wound | |
| 3.4 Treat a Casualty With Open Chest Wound | |
| 3.5 Treat a Casualty With Open or Closed Head Wound | |

- | | |
|--|----------|
| C-6. General Medical Treatment | * 1.5 hr |
| 6.1 Initiate Intravenous Infusion | |
| 6.2 Treat for Hypovolemic Shock | |
| 6.3 Manage Convulsive and/or Seizing Patient | |
| 6.4 Administer Initial Treatment for Burns | |

III. Provide Ground Ambulance Evacuation Support - Collective Training

- | | |
|--|---------|
| C-0. Provide Ground Ambulance Evacuation Support - Collective Training | * 2 hrs |
|--|---------|

* estimated hours of CBI to be developed by the Camp Dodge team

- PROVIDE GROUND AMBULANCE EVACUATION SUPPORT

Table F - 3

DEFEND COMPANY AREA

All Officers/NCOs

I. SUBJECT. Plan company defense

D-1. Terrain analysis (OCOKA)

* 1 hr

- 1.1. Observation and field of fire
- 1.2. Concealment and cover
- 1.3. Obstacles
- 1.4. Key terrain
- 1.5. Avenues of approach

D-2. Plan sector defense

* 0.5 hr

- 2.1. Platoon leaders plan sector defense
- 2.2. Section/squad leaders plan sector defense

D-3. Prepare support plans

* 1 hr

- 3.1. Company commander and leaders prepare preliminary base fire plan
- 3.2. Company commander and leaders prepare preliminary mobility and countermobility plan
- 3.3. Company commander and leaders prepare preliminary air defense plan
- 3.4. Company commander prepares reaction force plan
- 3.5. Company commander prepares ground early-warning plan

II. SUBJECT. Execute company defense

D-4. Defend/Prepare for Level I, II, and III threat/attack

* 0.5 hr

- 4.1. Company commander and leaders direct response against a Level I attack
- 4.2. Company responds to a Level I attack
- 4.3. Company responds to the effects of Level I attack
- 4.4. Company commander and leaders direct preparation for threat engagement
- 4.5. Company performs pre-engagement activities

D-5. Perform withdrawal under fire

* 0.5 hr

- 5.1. Company commander and leaders supervise disengagement under fire
- 5.2. Company performs fire and movement to rear

D-6. Conduct hasty displacement

* 0.5 hr

- 6.1. Company commander and leaders organize company for hasty defense
- 6.2. Company prepares for hasty displacement
- 6.3. Company destroys non-medical supplies, equipment, and documents
- 6.4. Company departs area
- 6.5. Rear security party provides security for company displacement

III. SUBJECT. Collective training for defend company area

D-0. Plan and execute company defense scenario

* 1 hr

- 7.1. Plan company defense
- 7.2. Execute company defense

* estimated hours of CBI to be developed by the Camp Dodge team

- DEFEND COMPANY AREA COURSE -

Appendix G

FSB/Company Training

(Lanes)

Course Guide

APPENDIX G

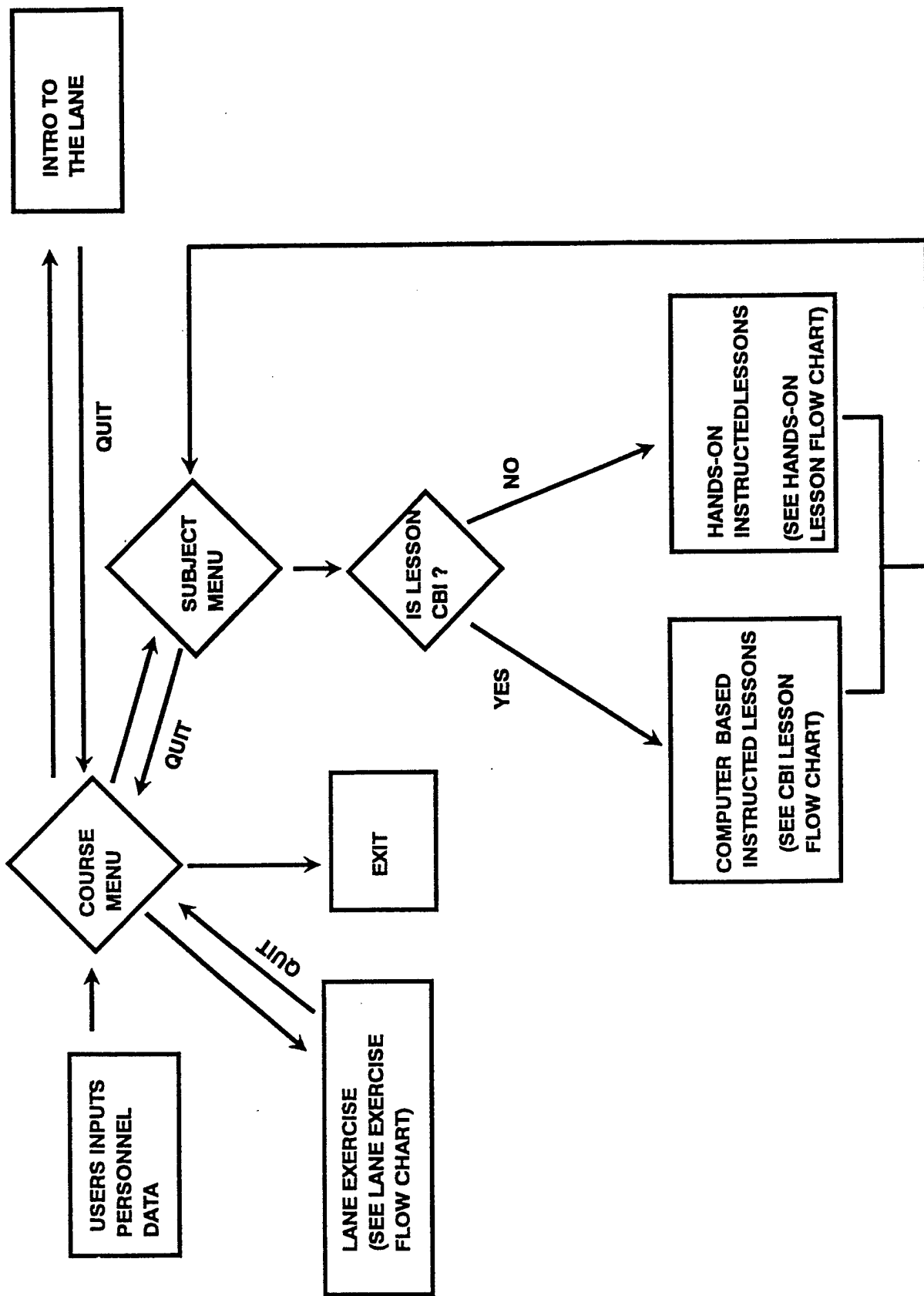
FSB COMPANY TRAINING (LANE) COURSE GUIDE

<u>Description</u>	<u>Page</u>
-Lane Flow Flow Chart	
-Flow Chart	G-1
-Description of Flow Chart Components	G-2
-CBI Lesson Flow Chart	
-Flow Chart	G-4
-Description of Flow Chart Components	G-5
-Hands-on Instructed Lesson Flow Chart	
-Flow Chart	G-7
-Description of Flow Chart Components	G-8
-Lane Exercise Flow Chart	
-Flow Chart	G-9
-Description of Flow Chart Components	G-10
-Milestones for Courseware Development	G-11

This appendix describes the functional flow of the FSB Company Training (Lanes). The tasks to be trained were developed by the ARPA Support Staff and are contained in appendix E.

The Lanes courses will be directed by a multimedia computer-managed instruction (CMI) module which will address all supporting tasks for the priority lanes. The lane tasks will be trained using CBI, hands-on instruction or other methods. The ARPA Support Staff has determined those tasks which are the most difficult to teach hands-on in an armory during Inactive Duty Training (IDT), and CBI will be developed for these tasks. (A detailed listing of the tasks comprising the CBI is located in Appendix F.) Further, they have identified logical grouping of tasks that can be taught together in hands-on training segments. The CMI component will guide the student and the training manager through both the CBI and hands-on segments of the course. Assessment procedures, training tips, and other recommendations will be provided for the training manager to use during the hands-on training. The CBI training segments will include pretests and post tests, the results of which will be tracked by the TMS. In addition, assessment results from hands-on training will be loaded directly into the TMS. Through the combination of CBI assessment and manual entry of hands-on assessments, the TMS will track student progress through all segments of the course, regardless of the training method used.

LANE FLOW CHART



LANE FLOW

Description of Flow Chart Components

COURSE MENU	The Course Menu contains 4 classes of options: Course Introduction, Lane Exercise, Subjects, and Exit. The user can select any option at any time. This menu is a part of the TMS.
INTRO TO THE LANE	This is the first selection on the Course Menu. It consists of a description of the lane concept and of the lane(s) presented in the course. The Introduction explains the mixture of CBI and Hands-on (HO) lessons and how the various lessons (and the tasks included in the lessons) fit into the lane. It displays and explains the leader and individual tasks involved in the lane and the suggested groupings for training the tasks. It explains how CBI lessons are presented, how prescriptions are made, how the student progresses through the lessons, and how pretest and post test scores are recorded. It also explains how pass/fail scores for hands-on training is loaded into the TMS and describes the various reports that are available to the training manager to track individual and unit progress.
LANE EXERCISE	The Lane Exercise is a computer-driven simulation of a hands-on lane exercise. It Covers the entire lane, start to finish, requiring simulated performance of all tasks involved in lane in the format of practical exercises. It is set up to run in various team configurations, including use by the full team (leader and all individuals), by a team of individuals with no leader, and by a leader without the individual team members. In situations where a full team is not present, the computer "plays the parts" of the missing member(s).
EXIT	This option exits the courseware system.
SUBJECT MENU	Selection of one of the subjects from the Course Menu results in the display of the appropriate Subject Menu. This menu consists of the lessons which make up the subject, and indicates which lessons are available in CBI format.

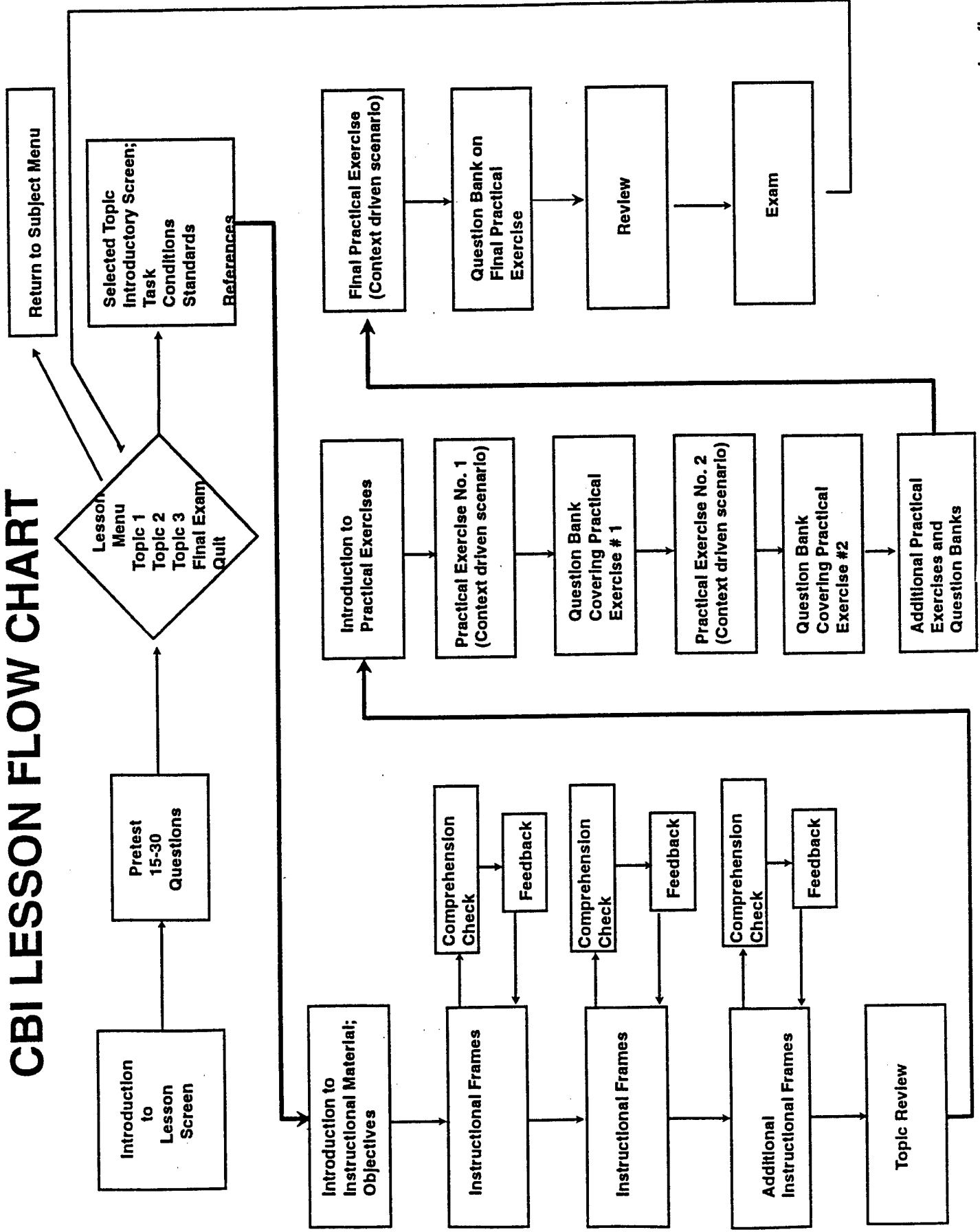
CBI LESSON

Selection of a CBI lesson from the Subject Menu places the user into the CBI lesson. The lessons consist of pretests, interactive instructional frames, comprehension checks, practical exercises(context-driven scenarios), and post tests. Non-browsing students are forced to take the lesson pretests before they are allowed to take the lesson topics. Otherwise, there are no constraints on student progression through the lessons. (See CBI Lesson Flow Chart for a more detailed description.)

HANDS-ON LESSONS

Selection of a HO lesson from the Subject Menu displays HO tasks and references for the lesson.

CBI LESSON FLOW CHART



CBI LESSON FLOW

Description of Flow Chart Components

INTRO TO LESSON	The student will see a screen that displays introductory information about the lesson (lesson title, information on pretest, etc.).
PRETEST	The pretest will be accessed and completed. The student's pretest scores will be displayed along with an instructional prescription. Successful completion of pretest questions associated with a task will constitute a "go" for that topic.
LESSON MENU	The Lesson Menu will then display choices for topics, final exam, or exiting out of the lesson. If Quit is chosen, control will proceed to the Subject Menu. The Final Exam will be chosen when all necessary topics have been completed.
SELECTED TOPIC	If a topic is chosen, the program will proceed to that topic's flow of instruction.
INTRO TO INSTRUCT. MATERIALS	The topic flow will generally start with a screen introducing the instructional material and objectives for that topic. Additional administrative processes, such as first time through topic or browse mode might also be indicated at this point.
INSTRUCT. FRAMES	Instructional frames will be displayed. These frames will contain instructional material (text, audio, and visuals) presented in an appropriate instructional format. The sequence of instructional frames, comprehension checks, and feedback will be repeated until the initial set of instructional material has been presented.
COMPREHENSION CHECKS	At appropriate times during the instruction, branching will occur to take the students to comprehension check questions.
FEEDBACK	Feedback to the student will be displayed based on the student's answer to the question.
TOPIC REVIEW	A topic review will occur after all instructional material has been presented. This review will emphasize the major learning points referenced to their specific learning objectives.
INTRO TO PRACTICAL EXERCISES	A screen will be displayed informing the student of upcoming practical exercises. Instructions on how the practical exercises will work and their purpose will be given.

**PRACTICAL
EXERCISES**

The practical exercises will pull together the learning material in a hands-on scenario that is as "real" as possible. Information can be sequentially revealed to the students or varied by their responses. Student interactions will be designed that will mimic the "real hands-on" interaction that might occur in a real hands-on training environment. Several practical exercises and questions may be included to incorporate variables to the training environment.

QUESTION BANK

Additional questions will be asked about the scenario and a review of major points will be displayed.

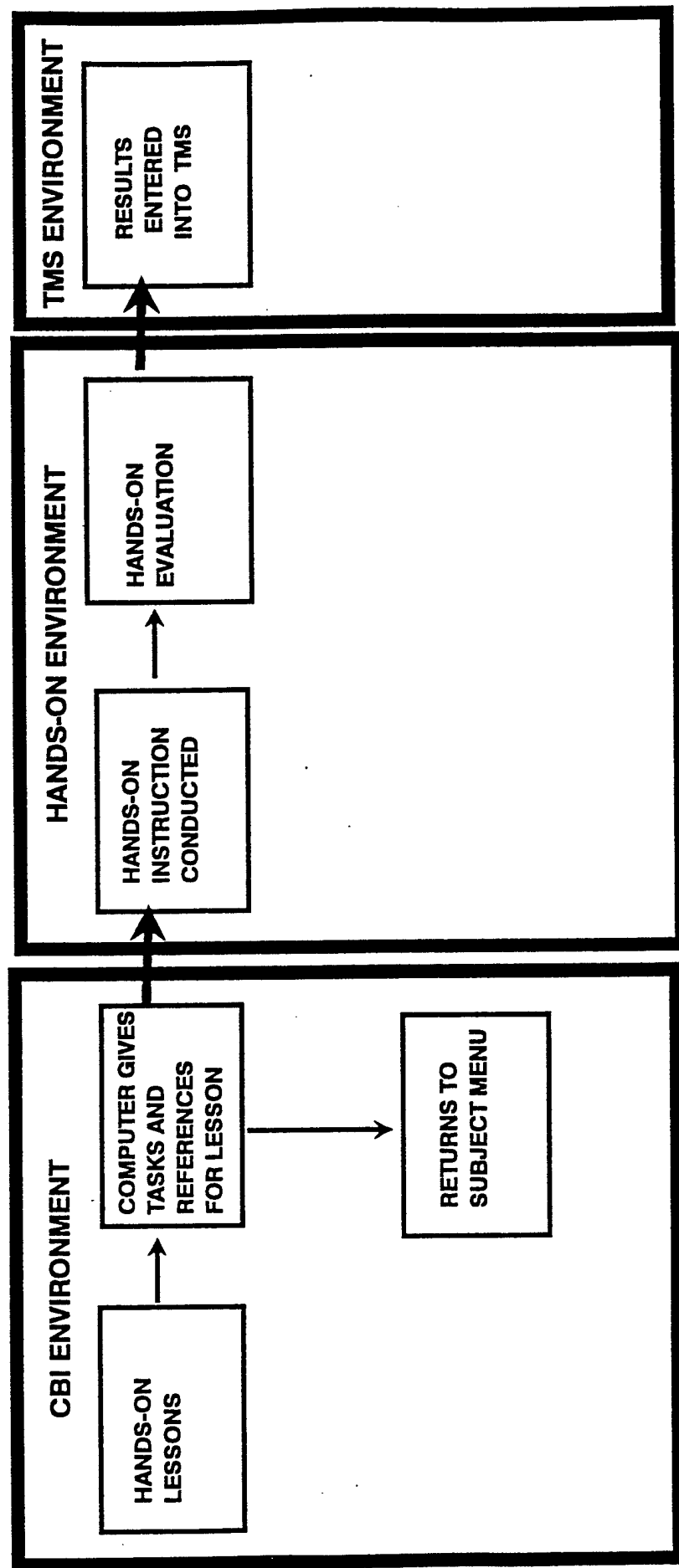
REVIEW

A final review of the entire topic will be presented.

EXAM

The student will take a final exam on the entire topic. Successful completion of exam questions associated with a task will constitute a "go" for that topic.

HANDS-ON INSTRUCTED LESSON FLOW CHART

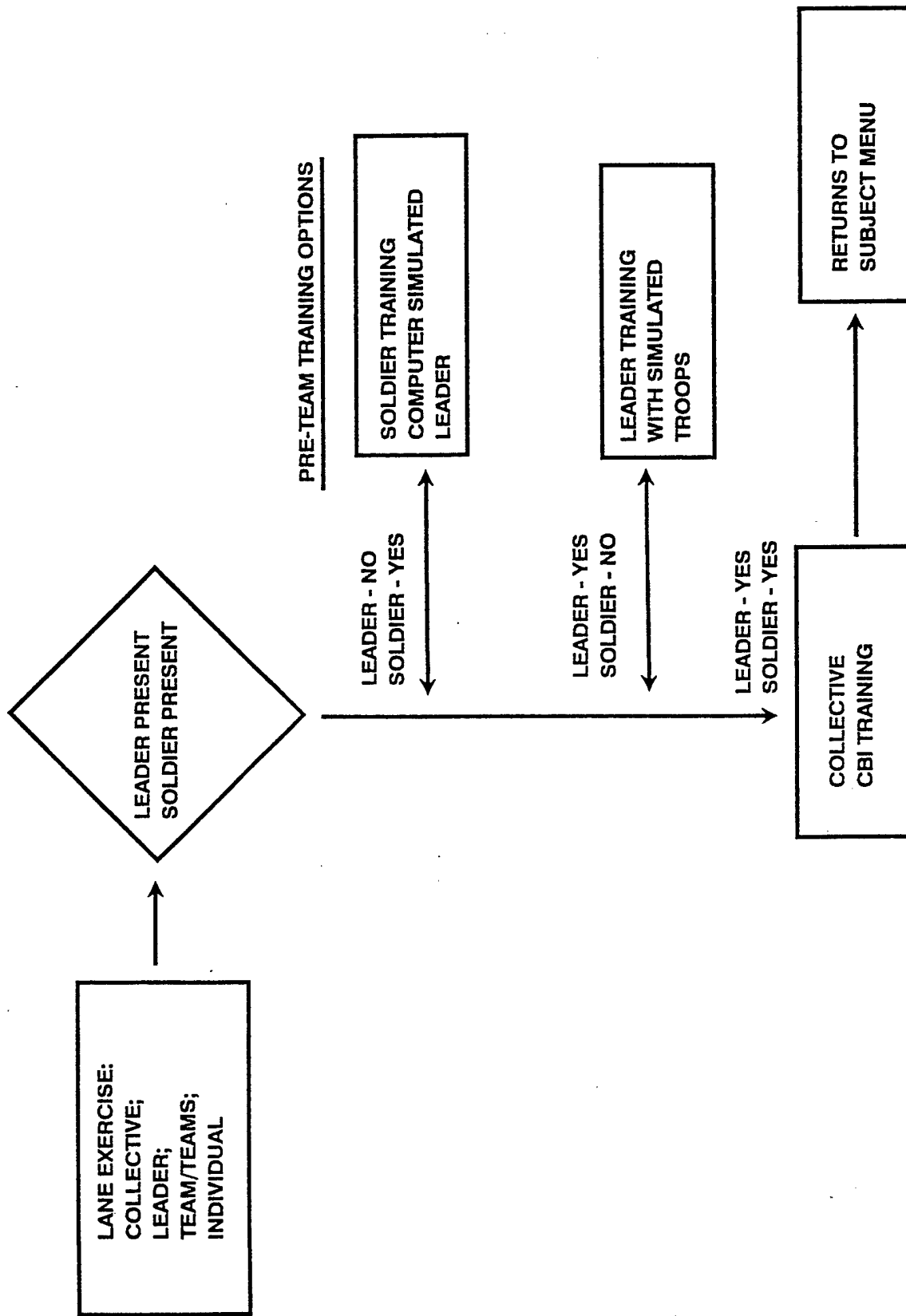


HANDS-ON INSTRUCTED LESSON FLOW

Description of Flow Chart Components

<i>CBI ENVIRONMENT</i>	<i>The computer-managed instruction (CMI) component of the CBI will contain information on the entire lane, including hands-on lessons.</i>
HANDS-ON LESSONS	Within the CMI, hands-on lessons will be described and training tips offered on their performance. The training manager can access this information by selecting the lesson from the Subject Menu.
TASKS & REFS.	The CMI component will list suggested tasks and references for all hands-on lessons within the lane.
SUBJECT MENU	The training manager will exit to the Subject Menu.
<i>HANDS-ON ENVIRONMENT</i>	<i>The hands-on environment is where hands-on training will actually be conducted by the unit after the training manager has received guidance information from the CMI and the published military training references (e.g., STPs and MTPs). This will usually be in an armory setting.</i>
HANDS-ON TRAINING	Hands-on training will be conducted at the discretion and under the direction of the training manager, using the information provided by the CMI and the training references.
HANDS-ON EVAL.	Hands-on training will be evaluated by qualified observers, based on the task standards.
<i>TMS ENVIRONMENT</i>	<i>The TMS environment is a computer database which collects data on individual performance of the tasks involved in the lane.</i>
HANDS-ON RESULTS ENTERED	Once the hands-on exercise has been conducted, and performance evaluations have been made, the data are manually loaded into the TMS.

LANE EXERCISE FLOW CHART



LANE EXERCISE FLOW

Description of Flow Chart Components

INTRO TO LESSON	The Lane Exercise is a computer-driven simulation of a hands-on lane exercise. It Covers the entire lane, start to finish, requiring simulated performance of all tasks involved in lane in the format of practical exercises. It is set up to run in 3 team configurations.
DECISION BOX	The answers to the questions on the decision frame will determine in what mode the exercise will be run. The questions concern the makeup of the students who wish to take the exercise. If only the leader is present, the exercise will run in leader training mode. If only the soldiers are present, the exercise will run in soldier training mode. If the entire team is present, the exercise will be run in collective training mode.
SOLDIER TRAINING	In this mode, the computer will "play the part" of the leader, allowing soldiers to complete the exercise without a leader present.
LEADER TRAINING	In this mode, the computer will "play the parts" of the soldiers, allowing a leader to complete the exercise without the soldiers present.
COLLECTIVE	In this mode, both leader and soldiers will take part in the exercise, and the computer will prompt the team through the exercise and keep track of the decisions made. This is the optimum mode for the Lane exercise.
SUBJECT MENU	Upon completion of the exercise, the student(s) will return to the Subject Menu.

Milestones for Course Development **FSB Multimedia**

Course: _____

Subject: _____

Lesson: _____

	<u>Due</u>	<u>Complete</u>
1. Write objectives (task, condition, standard) suitable for CBI.	_____	_____
2. Develop instructional strategies based on objectives.	_____	_____
3. Develop pretest/exam questions for each objective.	_____	_____
4. Determine learning activities for each objective.	_____	_____
5. Submit for critique/approval.	_____	_____
6. Develop storyboard drafts.	_____	_____
7. Submit for review.	_____	_____
8. Finalize storyboards.	_____	_____
9. Review storyboards with author(s).	_____	_____
10. Collect/produce graphics, video, and audio required.	_____	_____
11. Author first draft of courseware.	_____	_____
12. Review with SME and second instructional specialist.	_____	_____
13. Author second draft of courseware.	_____	_____
14. Review with SME and second instructional specialist.	_____	_____
15. Perform formal quality assurance (QA) procedures.	_____	_____
16. Revise courseware based on QA findings.	_____	_____
17. IPR with Anne Hamza.	_____	_____
18. Validate courseware.	_____	_____
19. Finalize courseware and deliver.	_____	_____